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Bilateral Seminars of the International Bureau

KERNFORSCHUNGSANLAGE JÜLICH GmbH

Ist German-Yugoslav Meeting
in the Framework of the Bilateral
Project

# Development of Innovation Structures in Yugoslavia

Edited by
G. Bräunling and V. Matejić

Innovation Consultancy Centers
Plitvice

September 5–7, 1988

GERMAN-YUGOSLAV COOPERATION
IN SCIENTIFIC RESEARCH AND TECHNOLOGICAL DEVELOPMENT

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# DEVELOPMENT OF INNOVATION STRUCTURES IN YUGOSLAVIA

## Innovation Consultancy Centers

Plitvice, September 5 – 7, 1988

edited by

Gerhard Bräunling
Vlastimir Matejić

Organizer of the Meeting:
Institute Mihailo Pupin, Belgrade

The work on "Development of Innovation Structures in Yugoslavia" as a bilateral project is done in the framework of German-Yugoslav Bilateral Cooperation.

Partner institutions : Mihailo Pupin Institute, Belgrade,

and

Fraunhofer Institut für Systemtechnik und Innovationsforschung, Karlsruhe

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# F O R E W O R D

by Johanna Krawczynski, International Bureau of KFA-Jülich

Within the Governmental Agreement on Cultural and Scientific Cooperation of 1969 between the Socialist Federative Republic of Yugoslavia and the Federal Republic of Germany, several Agreements were signed, among those the ones between YUZAMS and BMFT, the Federal Ministry for Research and Technology of FRG, as well as between YUZAMS and KFA-Jülich.

Originating from incentives we received during the OECD Meeting "Review of Science, Technology and Innovation Policies in Yugoslavia" in October 1987, a project was established between the Mihailo Pupin Institute in Belgrade and the Fraunhofer Institut für Systemtechnik und Innovationsforschung in Karlsruhe, from which resulted the idea of yearly seminars in the field of innovation research and consultancy, and management.

The Yugoslav side proposed to establish a tradition to hold, in the autumn of each year, a workshop on specific aspects of problems related to these topics, and the first one was held in September 1988 in Plitvice, the place where also coming seminars are planned to take place. The next one, under the title "Technological Development in Yugoslavia" will be held in Plitvice, from 17th to 20th October 1989.

In the frame of German-Yugoslav bilateral cooperation, taking up a project like the one between Mihailo Pupin Institute and Fraunhofer Institute (which is going beyond the traditional scope of purely natural sciences projects), has been an interesting experiment. In view of the Yugoslav priorities in the field of furthering market strategies for the improvement of the economy and the aim to stress the "European dimension" of non-alignment, project cooperation in this field is the need of the moment.

If, in this stage, seminars help to first of all establish a realistic insight into the problems of Yugoslavia in the field of innovation strategies and a realistic insight in what should and can be done, they will have already proved their use for the implementation of such strategies, which must follow now.

In the present publication materials of lectures, which have been held during the First Plitvice Seminar, have been collected. They are compiled with the aim of further disseminating their contents. The working papers of the authors have remained unchanged, the liability therefore remains with them.

INTRODUCTION TO THE WORKSHOP AND
SUMMARY OF RESULTS

by Fraunhofer Institut für Systemtechnik und Innovationsforschung,
K a r l s r u h e

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**Results of the Yugoslav-German Workshop on Innovation Consultancy Centers**

September 5 to 7, 1988, Plitvice

## 1. Aim of the Workshop

With regard to the discussion on the further development of Yugoslav industry, two questions play a major role: what concepts are required to set up innovation consultancy centers in Yugoslavia, and which organizations are able to set up and manage such centers on a regional basis efficiently. There are, however, controversial positions on the organizational concepts, the working mechanisms and the achievable economic results of such centers, and experience in this respect is completely lacking in Yugoslavia.

In the Federal Republic of Germany, a pluralistic system of technology transfer and innovation consultancy centers has developed over the last ten years. Essential elements of this system developed out of the services and institutions created by experimental programmes financially supported by the Federal Ministry for Research and Technology.

The aim of this workshop was to present different types of regional innovation consultancy centers in the Federal Republic of Germany, to discuss the chances, problems and results associated with the work of these centers and to develop personal links between managers of German innovation consultancy centers and representatives from Yugoslav institutions and organizations which are considering or planning to start similar consultancy office.

2. **Substance of the Workshop** (see doc. 1: programme)

In his introduction to the workshop Prof. **Matejic** gave an outline of the present situation in Yugoslavia placing special emphasis on
- technological level of industry
- the sources of knowledge and know-how for technology transfer to established and newly founded firms,
- the innovation infrastructure,
- new approaches in innovation policy and
- contributions of different kinds of institutions to the support of new policies.

This overview was based on the MPI's project "Strategy of Technological Development of Yugoslavia up to the Beginning of the 21st Century" and led to the question of what could be learned from technology transfer agencies and innovation consultancy methods in other countries such as West Germany. The opening speech was given in Serbo-Croatian without translation.

The **German** speakers presented the experiences

- of a consultancy office of a chamber of commerce, cooperating closely with the university and a large-scale research establishment, and which is also engaged in the management of an incubator unit, (Mr. Hüske from Aachen; doc. 3)

- of an university industry liaison office, operating in an industrially less developed region, focussing on contract research and consultancy, (Mr. Meeh from Kassel; doc. 4)

- of a regional organization of the rationalization board, working and cooperating closely with free-lance consul-

tants and technical colleagues, (Mr. Fridrich from RKW Stuttgart; doc. 5)

- of the BMFT's experimental scheme to promote new technology-based firms, which promotes innovation and management consultancy services provided by regional innovation consultancy centers and commercial consultants (Mr. Mayer from ISI, Karlsruhe; doc. 6).

The German managers and experts presented

- an overview on the major activities of their organization,

- the problems associated with starting new innovation services,

- the needs of their clients and the range of services they render,

- cooperation and problems in and between technology transfer offices.

In addition to these case reports, an overview was presented on

- the major conceptual approaches in innovation consultancy that had been developed during different stages of publicly financed research and development (R&D) and on the basis of procedures of semi-public business counselling services

- a functional typology of institutions and their services, such as
  - o **contact points** set up within trusted institutions to provide initial guidance;

- o **advisory units** with adequate diagnostic expertise to liaise with expert consultants and supervise the innovation process;
- o **consultancy centres** with teams of advisers who are capable of differentiated problem diagnosis, providing personal advisory services on specific technological problems and establishing links with qualified consultants;
- o **technology centres** which work primarily on the development of new technology and employ specialists over the entire range from initial to in-depth consultancy and
- o **information brokers** who organize database searches on the basis of a description of the technological problem and evaluate the results obtained.

- on different models in the operational procedures and methods of innovation consultants,

- cooperation and conflict patterns between consultancy centers, counsellers, commercial consultants, client companies and specialists at research institutes, and

- the role of federal and Länder funding for the establishment and current operations of consultancy centers (Mr. Bräunling from ISI, Karlsruhe; doc. 7).

The presentations were in English; in addition, an English/Serbo-Croatian consecutive translation was provided.

## 3. Results of the Discussions at the Workshop

The Yugoslav participants were representatives from Chambers of the Economy, from Committees for Science and Technology, from Councils of Self-Management Communities for Interest on Science, from companies and from research institutes

(see document 2). They focussed the discussion on the following questions:

- the role of university researchers in the transfer of technology,
- "active" or "passive" acquisition of clients,
- federal and state financial support for consultancy offices and consultancy services,
- prices and quality control of competition between consultancy services,
- the relationship between management conultancy services and innovation consultancy services.

The general impression was that some of the Yugoslav participants had only little experiences and unrealistic expectations concerning innovation consultancy centers, and that they had underestimated the resources needed to establish and run such a center. The discussions at the workshop showed them that the successful management of innovation consultancy centers of the type presented requires a developed industrial structure, qualified personnel and financial resources. It would seem that these requirements are currently not generally available in any Yugoslavian region.

## 4. Follow-up Actions

The Yugoslav-German workshop stimulated Yugoslav initiatives and the need for both additional and more concrete information. Amongst the participating institutions and organizations, it provided a sound basis for the discussion regarding needs, concepts and initiatives for regional innovation consultancy centers in Yugoslavia.

- Several Yugoslav participants requested reports, addresses, and further information documents on German innovation consultancy centers. This information will be provided by the Fraunhofer Institute for Systems and Innovation Research.

- A Yugoslav delegation will visit selected innovation consultancy centers in the Federal Republic of Germany.

- Yugoslav internal workshops will follow, e.g. in Maribor.

- Two Republics are considering regional workshops to discuss their strategy and may even ask for a presentation on the experiences made in the Federal Republic of Germany.

- Professor Matejic will visit the Fraunhofer Institute for Systems and Innovation Research in Karlsruhe as a guest researcher late in 1988 and early in 1989.

PROGRAMME OF THE WORKSHOP

**CENTAR ZA ISTRAŽIVANJE RAZVOJA NAUKE I TEHNOLOGIJE**
INSTITUT MIHAJLO PUPIN, BEOGRAD

•

**SCIENCE AND TECHNOLOGY POLICY RESEARCH CENTRE**
MIHAJLO PUPIN INSTITUTE , BELGRADE

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**S E M I N A R**

INOVACIONI CENTRI - NACIONALNA TEHNOLOŠKA INFRASTRUKTURA

**P L A N R A D A**

**4.09.1988.**

| | |
|---|---|
| 18,00 - 21,00 | Registracija učesnika |

**5.09.1988.**

| | |
|---|---|
| 8,00 - 9,00 | Registracija učesnika |
| 9,00 - 9,05 | Predstavnik Saveznog komiteta za nauku i tehnologiju |
| 9,05 - 9,10 | Predstavnik Privredne komore Jugoslavije |
| 9,10 - 9,15 | Predstavnik Saveta SIZ-ova za naučni rad Jugoslavije |
| 9,15 - 9,20 | Predstavnik Republičkog komiteta za znanost, tehnologiju i informatiku SR Hrvatske |
| 9,20 - 9,25 | Informacija o programu i načinu rada |
| 9,25 - 10,00 | VLASTIMIR MATEJIĆ: Inovaciona infrastruktura Jugoslavije |
| 10,00 - 10,15 | P a u z a |
| 10,15 - 12,00 | KLAUS MEEH: Iskustva Ureda za transfer tehnologije na univerzitetu |
| 12,00 - 12,15 | P a u z a |
| 12,15 - 13,15 | Pitanja, odgovori i diskusija |
| 13,15 - 17,00 | Ručak i odmor |
| 17,00 - 18,45 | ALBRECHT FRIDRICH: Iskustva regionalne agencije za konsultovanje malih firmi |
| 18,45 - 19,00 | P a u z a |
| 19,00 - 19,45 | Pitanja, odgovori i diskusija |
| 19,45 - | Večera |

**S E M I N A R**

INNOVATION CENTRES - NATIONAL TECHNOLOGICAL INFRASTRUCTURE

**T I M E T A B L E**

**September 4, 1988**

| | |
|---|---|
| 18,00 - 21,00 | Registration |

**September 5, 1988**

| | |
|---|---|
| 8,00 - 9,00 | Registration |
| 9,00 - 9,05 | Representative of the Federal Committee for Science and Technology |
| 9,05 - 9,10 | Representative of the Yugoslav Chamber of Commerce |
| 9,10 - 9,15 | Representative of the Federal Counsil of Self-management Communities for Interest in Science |
| 9,15 - 9,20 | Representative of the Republic Committee for Science, Technology and Information of SR of Crotia |
| 9,20 - 9,25 | Information about seminar programme |
| 9,25 - 10,00 | VLASTIMIR MATEJIĆ: The Yugoslav Innovation Infrastructure |
| 10,00 - 10,15 | B r e a k |
| 10,15 - 12,00 | KLAUS MEEH: The Experience of a University Based Technology Transfer Office |
| 12,00 - 12,15 | B r e a k |
| 12,15 - 13,15 | Questions, answers adn discussion |
| 13,15 - 17,00 | Lunch |
| 17,00 - 18,45 | ALBRECHT FRIDRICH: The Experience of a Regional Small Business Counseling Agency |
| 18,45 - 19,00 | B r e a k |
| 19,00 - 19,45 | Questions, answers and discussion |
| 19,45 - | Supper |

| 6.09.1988. | | September 6, 1988 | |
|---|---|---|---|
| 9,00 - 10,45 | VOLKER HEPPLE: Iskustva regionalne privredne komore | 9,00 - 10,45 | VOLKER HEPPLE: The Experiences of a Regional Chamber of Commerce and Industry |
| 10,45 - 11,00 | P a u z a | 10,45 - 11,00 | B r e a k |
| 11,00 - 12,00 | Pitanja, odgovori i diskusija | 11,00 - 12,00 | Questions, answers and discussion |
| 12,00 - 13,30 | Obilazak Plitvičkih jezera | 12,00 - 13,30 | Sightseeing of the Plitvice lakes |
| 13,30 - 17,00 | Ručak i odmor | 13,30 - 17,00 | Lunch |
| 17,00 - 18,45 | MICHAEL MAYER: Inovacioni servis za nove, na tehnologiji zasnovane firme | 17,00 - 18,45 | MICHAEL MAYER: Innovation Services for Young Technology Based Firms |
| 18,45 - 19,00 | P a u z a | 18,45 - 19,00 | B r e a k |
| 19,00 - 19,45 | Pitanja, odgovori i diskusija | 19,00 - 19,45 | Questions, answers and discussion |
| 19,45 - | Večera | 19,45 - | Supper |

| 7.09.1988. | | September 7, 1988 | |
|---|---|---|---|
| 9,00 - 10,45 | GERHARD BRÄUNLING: Sistem inovacionog konsaltinga u SR Nemačkoj | 9,00 - 10,45 | GERHARD BRÄUNLING: The System of Innovation Consultancy in FR of Germany |
| 10,45 - 11,00 | P a u z a | 10,45 - 11,00 | B r e a k |
| 11,00 - 11,45 | Pitanja, odgovori i diskusija | 11,00 - 11,45 | Questions, answers and discussion |
| 11,45 - 13,15 | Saopštavanje jugoslovenskih iskustava po želji učesnika | 11,45 - 13,15 | Reporting of Yugoslav experiences |
| 13,15 - 17,00 | Ručak i odmor | 13,15 - 17,00 | Lunch |
| 17,00 - 18,45 | LABROS GATZIS: Grčka iskustva | 17,00 - 18,45 | LABROS GATZIS: Greek experiences |
| 18,45 - 19,00 | P a u z a | 18,45 - 19,00 | B r e a k |
| 19,00 - 20,00 | Pitanja, odgovori i diskusija | 19,00 - 20,00 | Questions, answers and discussion |
| 20,00 - | Večera | 20,00 - | Supper |

| 8.09.1988 | | September 8, 1988 | |
|---|---|---|---|
| 8,30 - 10,00 | Saopštavanje namera učesnika u vezi osnivanja inovacionih centara u SFRJ | 8,30 - 10,00 | Reports by possible founders of Innovation Centers in Yugoslavia |
| 10,00 - 10,15 | P a u z a | 10,00 - 10,15 | B r e a k |
| 10,15 - 12,00 | - Planiranje akcija i pomoći na osnivanju inovacionih centara u SFRJ<br>- Studijska poseta SR Nemačkoj<br>- Ostalo | 10,15 - 12,00 | - Planning the actions and help for founding the Innovation Centers in Yugoslavia<br>- Study mission to the Federal Repulic of Germany<br>- Other related matters |
| 12,15 - 14,00 | Sastank Radne grupe za naučnu saradnju sa OECD | 12,15 - 14,00 | Meeting of the Working group for scientific cooperation with OECD |

**VAŽNIJE INFORMACIJE**

1. Učesnici dobijaju skraćene tekstove predavanja.

2. Učesnici zainteresovani za obilazak Plitvičkih jezera treba da se prijave drugarici Dušici Semenčenko do utorka 6.9. do 9 časova.

3. Učesnici zainteresovani za organizovani prevoz na relaciji Plitvice-Zagreb u četvrtak 8.9. treba da se prijave drugarici Dušici Semenčenko do 7.9. do 20 časova.

4. Pozivaju se učesnici da predlože dopune i inovacije programa rada seminara.

5. Učesnicima se stavljaju na uvid rezultati naučnoistraživačkog projekta "Strategija tehnološkog razvoja Jugoslavije do početka XXI veka". (Obratiti se drugarici D.Semenčenko)

6. Za sve informacije možete se obratiti:

   Programskom sekretaru seminara Mr Djuri Kutlači tel. 011/774-452

   Organizacionom sekretaru seminara Dušici Semenčenko tel. 011/772-042
   Institut Mihajlo Pupin, Beograd, Volgina 15
   telex - 11584 yu imp bg
   telefax 011/774-614

   Hotel "Jezero"
   Nacionalni park Plitvice
   48231 Plitvice
   tel. 048/76-314, 76 524, 76-544
   telex - 23817 yu plitvice
   telefax 048.76-310

7. Program rada seminara podleže eventualnim izmenama.

**IMPORTANT INFORMATION**

1. Participants will obtain shortened versions of lecture texts.

2. Participants interested in the sightseeing tour of the Plitvice Lakes should inform Mrs. Dušica Semenčenko not later than Tuesday, September 6, up to 9 a.m.

3. Participants wishing to use organized transportation from Plitvice to Zagreb on Thursday, September 8, should inform Mrs. D.Semenčenko not later than September 7, up to 8 p.m.

4. Participants are invited to suggest additions and innovations to Seminar Programme.

5. Participants will have the opportunity into the results of research project "The Strategy of Yugoslavia's Technological Development up to the Beginning of the 21st Century".

6. For any further information please contact:

   Program secretary Mr Djuro Kutlača tel.011/774-452
   Organizing secretary Mrs.Dušica Semenčenko
   tel. 011/774-452
   Mihajlo Pupin Institute, Belgrade, Volgina 15
   telex - 11584 yu imp bg
   telefax 011/774-614

   Hotel "Jezero"
   National Park Plitvice
   48231 Plitvice
   tel. 048/76-314, 76-524, 76-544
   telex - 23817 yu plitvice
   telefax 048/76-310

7. Seminar Programme is subject to slight modifications.

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**Organizator seminara:**
CENTAR ZA ISTRAŽIVANJE RAZVOJA NAUKE I TEHNOLOGIJE
INSTITUT MIHAJLO PUPIN, Beograd

*

**Pokrovitelj seminara:**
SAVEZNI KOMITET ZA NAUKU I TEHNOLOGIJU

*

**Sponzori:**
Ministarstvo za istraživanje i tehnologiju SR Nemačke,
OECD - TECO

*

**Rukovodilac seminara:**
Prof.dr Vlastimir Matejić

*

**Programski sekretar seminara:**
Mr Djuro Kutlača

*

**Organizacioni sekretar seminara:**
Dušica Semenčenko

**Organized by:**
SCIENCE AND TECHNOLOGY POLICY RESEARCH CENTER
MIHAJLO PUPIN INSTITUTE, Belgrade

*

**Under the umbrella of:**
FEDERAL COMMITTEE FOR SCIENCE AND TECHNOLOGY

*

**Sponsored by:**
Ministry for research and technology of FRG,
OECD - TECO

*

**Seminar chairman:**
Prof.dr Vlastimir Matejić

*

**Program secretary:**
Mr Djuro Kutlača

*

**Organizing secretary:**
Mrs. Dušica Semenčenko

| IME I PREZIME | INSTITUCIJA/TEL. | ADRESA |
|---|---|---|
| 1. Bogdan Stanić | Pokrajinski kom. za nauku i inform.Vojv. | Novi Sad, Bulevar Maršala Tita 16 |
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| 5. | Mario Polić | Zavod za zemlje u razvoju 041/444-417 | Zagreb, 8.maja 8 |
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| 6. | Zoran Milić | Zavod za informatiku i telekomunikacije | Split, Poljudski put bb 058/49-870 |
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| 8. | Jovica Todorović | SIZ tehničke kulture Pula 052/24-022 | Pula, Matka Laginje 3/III |

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| ). Jovo Milošević | PK Gospić 048/2041 | Gospić, Jn.. 15 |
| . Jovan Milivojević | Zavodi Crvena Zastava 034/68-140/48-43 | Kragujevac, Španskih boraca 4 |
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| . Zoran Trputec | Institut za zemlje u zazvoju 041/444-417 | Zagreb, 8.maja 82 |
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| . Radmila Kiprijanova | Republički kom. za nauka tehnol.razvoj i inform. 091/238-628 | Skoplje, Bihačka 5 |
| . Ljupčo Arsov | - " - | - " - |
| . Obrad Rašković | Reg. privr. komora Niš | Niš, Kej Pavla Glavinića 2a |

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| 46. Milivoj Obad | PK Zagreb | Zagreb, Ilica 49 |
| 47. Zvonimir Radić | RP ISOT | Zagreb, Berislavićeva 6 |
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| 49. Milutin Ostojić | SIZ na nauku SR Crne Gore | Titograd, Cetinjski put bb |
| 50. Karlo Vitez | "Sever" Subotica | Subotica |
| 51. Djuro Kutlača | Institut M.Pupin | Beograd, Volgina 15 |
| 52. Slobodan Petrović | - " - | - " - |

19.12.1988
-/bm/Matejic

Vortrag Prof. Dr. Vlastimir MATEJIC,
Science and Technology Policy
Research Centre
Mihajlo Pupin Institut, Beograd

# THE CORE OF INNOVATION CENTER NETWORK IN YUGOSLAVIA

## 1. Definition

Innovation centers are, in their basic purpose and function, organizations that help in establishing very direct contacts between those possessing technologies (in any form) and those requiring the technologies (for their present or future needs). By performing this function, the innovation centers stimulate the occurence of the needs for new technological solutions and the creation of ideas for utilizing the available technologies; support the communication between any actual or potential creator of technologies or supporter of technological innovation, on one hand, and all those that take part in the application of technologies innovation (manufacturing firms, banks, chambers of industry, public services, etc.).

## 2. Alternative types of innovation centers

What is meant by the term innovation center is a larger number of alternative ways of performing the functions and serving the purposes stated in the above given definition. We describe here the parameters of three types of innovation centers from which it is possible to derive, through an appropriate combination and elaboration, such a physiognomy of an innovation center as an innovation center as is fully adapted to the conditions, needs and ambitions of each actual environment - region in Yugoslavia.

Type 1: Liaison Unit

Basic Goal: To link efficiently those having the technologies or the capabilities to create them with those requiring new or improved technological solutions.

Users:
1. Small- and medium-sized enterprises (with up to 1,000 employees) and other potential technology users.
2. All those possessing the technologies and knowledge required for rapid generation of technological solutions, primarily: larger enterprises, R&D units within enterprises, R&D institutes, laboratories at universities, high schools or vocational schools, innovators, etc.

Scope of work:
1. Creation and updating of data bases on all potential users (those requiring and those possessing the technologies).
2. Animation and promotion of the occurence and growth of technology demand.
3. Animation of technology supply.
4. Initiation of contacts between technology demand and technology supply supporters.
5. Identification of barriers on the development and application of technologies.

Typical method of work:
1. Personal contacts with organizations and individuals, invitations and visits

to those requiring new technological solutions and those who can offer them.

2. Dissemination of written information (e.g. from technology data banks, newspapers, journals, personal notes, etc.).

Staff: One technically educated and competent person, communicative, familiar with technological problems of the economy of the relevant region, interested in achieving personal promotion through this type of work rather than through personal engineering efforts.

Premises and equipment: An office, a telephone, data files on organizations and individuals - potential clients, library with manuals and advertising material on technologies, selected articles from a few journals, etc.

Funding: In the first three years, the founder covers 100 % cost; in the next three years 40 % of the cost is covered by users; later 60 % is covered by users, and 40 % by founders.

The most appropriate institutional solution: The founders of this unit should be, primarily:

a) a regional chamber of industry,
b) a regional community for research (if it exists),
c) a regional government or a particular community government.

In most cases, the relevant chamber of industry should provide, because it is in a position to, the premises and the staff member. Most often these chambers already have at least one person who could perform this job properly.

Type 2: Consultancy-Liaison Unit

Basic Goal: To provide advisory assistance and to link efficiently those requiring the technologies with those capable of meeting these requirements.

User:
1. Small and medium-sized enterprises (with up to 1,000 employees) and other potential technology consumers.
2. All those possessing the technologies and knowledge required for rapid generation of technological solutions, primarily: larger enterprises, R&D units within enterprises, R&D institutes, laboratories at universities, high schools or vocational schools, innovators, etc.
3. Larger enterprises without organized in-house R&D as well as other larger technology requiring organizations.

Scope of work:
1. Free-of-charge consultancy service in the field of technologies, organization and marketing intended only to identify the needs for the development and application of new technological, organizational and marketing solutions and to provide a reliable information

and advice on how and where so identified needs can be satisfied.

2. Paying regular (at least once a year) visits to all manufacturing organizations in the relevant region in order to provide information to enterprises about the possibilities for solving efficiently their technological, organizational and marketing problems.

3. Creating and updating of data bases on all potential users (those requiring and those possessing the technologies).

4. Animation and promotion of the occurrence and growth of technology demand.

5. Animation of technology supply.

6. Initiation of contacts between technology demand and technology supply supporters.

7. Identification of barriers on the development and application of technologies.

Typical method of work:

1. Provision of basic consultancy services in the domain of the initial basic diagnosis of technological, organizational and marketing problems.

2. Finding the organizations and individuals capable of solving successfully the identified problems of enterprises and establishing the links between such organizations and individuals and the enterprises.

3. Finding suitable financial arrangements for the enterprises/users of consultancy services, especially for using various social funds and otherwise

integrated resources (self-management communities, export stimulation, etc.).

4. Personal contacts with organizations and individuals, invitations and visits of those requiring new technologies and to those who can offer them.
5. Dessemination of written information (e.g. from technology data banks, newspapers, journals, personal notes, etc.).

Staff:

1. One technically educated and competent person, communicative, familiar with technological problems of the economy of the relevant region, interested in achieving personal promotion through this type of work rather than through personal engineering efforts.
2. Two to three professionals competent for consultancy diagnostics engaged either directly on part (1/3) time basis or through their parent organizations. These individuals pay visits, either in a fixed sequence or upon ad hoc requests, to the enterprises in order to identify their problems and suggest the engagement of those possessing the technological and other knowledge required for solving the problems.

Premises and equipment:

An office, a telephone, data files on organizations and individuals - potential clients, library with manuals and advertizing material on technologies, selected articles from a few journals, etc.

Funding: In the first two years, the founders cover 100 % cost; later 40 % of the cost is covered by the founders and the remaining portion from the prices of services to be charged to users.

The most appropriate institutional solution: The founders of this unit should be primarily:

a) a regional chamber of industry,
b) a regional community for research (if it exists),
c) a regional government or a particular community government.

In most cases, the relevant chamber of industry should provide, because it is in a position to, the premises and the staff members. Most often these chambers already have at least one person who could perform this job properly.

Note: This unit must not turn into an autonomous consultancy unit.

Type 3: Consultancy-Incubation Center

Basic Goal: To provide efficient information, consultancy and other assistance to the initiators of ideas for developing the production (material, service, intellectual) based on new competitive technologies.

Users:

1. All those interested in capital investment into the development and exploitation of new technologies.
2. All those having clear and promising ideas for the development of a new technological solution.

3. All those interested in the development of production based on the transfer of available technologies - regardless of their origin.

Scope of work:

1. Provision of information services (on the interest shown by a social-political community, on the barriers and favourable conditions, on all the necessary conditions and documentation, etc.) on market and production opportunities to all those interested in investment.
2. Making the measuring, processing, experimental and other development equipment available to the individuals having a clear and promising idea for developing a new technology.
3. Providing information services, advice, consultancy and similar support to those having innovative ideas.
4. Establishing contacts among individuals and organizations interested in the development of new production in order to
   a) provide (by development or transfer) a new and competent technological solution,
   b) research the market,
   c) acquire the necessary investment resources,
   d) make contacts with future suppliers and buyers,
   e) settle all legal matters related to founding new production, etc.

   This incubation function of the Center is of particular importance, because a

new efficient producer can be obtained only when this function has been performed successfully.

Typical method of work:

1. The Center establishes links among interested parties, provides advisory assistance and helps in overcoming the barriers.
2. Through its work the Center ensures mutual support among the users of its services in that a considerable portion of the risk associated with the development of technologies made possible by the Center is shared among the successful users of its services.

Staff:

1. Manager of the Center (full-time engagement)
2. A technician or a highly skilled worker to maintain the equipment, devices and workroom (full-time engagement).
3. Administrator - librarian of the Center (full-time engagement).
4. Consultants (one-third time basis or ad hoc engagements).

Premises and equipment:

1. Two to three smaller workrooms occupied over a certain period by those having innovative ideas to permit them to study, carry out experiments, process the results of experiments, etc.
2. One office used as the Manager`s workroom as well as for negotiations and agreements by those interested in investment and development of production opportunities.

3. A reading room.
4. Smaller processing machines, measuring instruments, various devices required for making prototypes and their components, installations with the basic energy supply etc. that are made available to the innovators to perform technical tests in realizing their innovative ideas.

Funding: In the first year, 100 % cost of the Center's work is covered by founders. The equipment is provided, as a rule, as a gift by the organizations that do not need it any longer. After the first year, the successful ventures (development of new technological solutions, founding of new organizations, transfer and exploitation of technologies, etc.) take over a growing share in funding the work of the Center: 15 % in the second year, 25 % in the third, 45 % in the fourth year, and later 100 % of the total cost.

The most suitable institutional solution: Association of communities, a region, a neighbouring region and their associated chambers of industry are the founders of the Center which is an autonomous organization responsible for implementing the policy and goals for which it has been founded.

## CONCLUSIONS OF THE SEMINAR

The participants agreed that the Seminar was a success and reached the following conclusions:

a) The network of Innovation Centers in Yugoslavia should be developed and an initiative should be given to find the best ways for developing the network. Evaluation of the current state should be performed and a feasibility study made by the end of the year.

b) Proposal for the development of Innovation infrastructure in Yugoslavia should be submitted to the Federal Executive Council, the Chamber of Economy of Yugoslavia, and the Fund for Crediting the economically insufficiently developed republics and autonomous province of Kosovo.

c) International cooperation in this field should be developed and the most suitable financial possibilities in the transfer of knowledge etc. should be utilized.

d) For the purpose of preparing and supporting the initiative as well as coordinating and evaluating ideas, coordination board for the implementation of Innovation Centers Network in Yugoslavia was formed by eight members from Yugoslavia.

## STATE-OF-THE-ART IN INNOVATION INFRASTRUCTURE

1. In some regions and places there exist about the Innovation Centers in embryo or in a somewhat more developed form. All those centers are not linked or associated in any way and know absolutely nothing about each other's work.

2. The existing centers lack both social assistance, stimulation and guidance and social funds. This gives rise to a great discrepancy between the needs for them, which are great, and the conditions for their work, which are minimum.

What should be done

1. To familiarize all important agents involved in the technological development of Yugoslavia with the results of the research project "The Strategy of Technological Development of Yugoslavia by the Beginning of the 21st Century", which contains the fundamentals of the development of technology infrastructure, as well as many other fundamentals and elements of the strategy of technological development.

2. With the majority of the mentioned agents, it is necessary to provide at least one professional who will study and monitor the development of innovation infrastructure and the field of technology development in general and will serve as an information point for communication among the subjects and will give information to organizations and individuals for the purpose of faster realization of innovation initiatives. This is especially necessary in the period preceding a more serious development of Innovation Centers and other elements of innovation infrastructure, that will take over this informative role.

3. Although the fundamentals of technology infrastructure are dealt with in the mentioned "Strategy of Technological Development of Yugoslavia by the Beginning of the 21st Century", they do not suffice for taking actual steps concerning the realization of the infrastructure. To avoid errors, and especially to avoid discrediting the main ideas of innovation infrastructure, it is

necessary to realize the project "Conditions and Possibilities for Realizing the Initial Stage of Forming Innovation Centers Network in SFRY in 1989-1991 Period".

4. The Innovation Seminar should be held each year as a part of scientific cooperation with Federal Republic of Germany.

Doc. 3

ENTERPRISE MANUAL

List of the Enterprises and Products
of the Economic Region of Aachen

edited by the
Chamber of Industry and Commerce
of Aachen

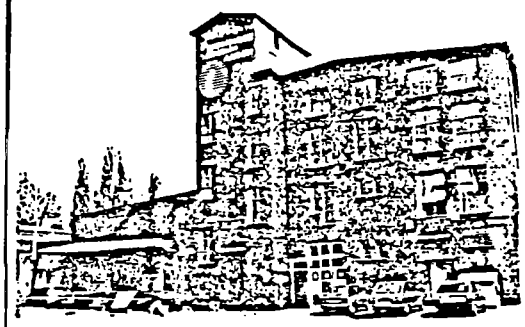
Aachen, 1985

Enterprise Manual AGIT

The constituents of technology transfer

- innovation consultancy services of the region
- co-operation contract between the university and the Chamber of Industry and Commerce of Aachen
  - technological consultancy for enterprises
  - contract research and project development
  - project teams
  - information lectures and seminars about new technologies
- research manual
  list of 200 institutions of research, developm it, advice in the economic region of Aachen
- enterprise manual
  list of 500 producing enterprises and their products
- technology market
  list of 150 developments, both technology supply and demand
- licence
  supply of selected inventions which are applied for patents or utility model patents
- subsidized technology consultancy of Chambers of Industry and Commerce of Northrhine-Westphalia
- data bank enquiries
- technology centre Aachen

Constituents of technology transfer AGIT



New impulses in old sheds

The Technology Centre Aachen has its site in a rebuilt factory. With its floor space of 7700 square meters it offers room for the stablishment of about 30 innovative enterprises.

AGIT

use of equipment:
- telephone system (Nixdorf digital system) with one extension per room
- the use of these telephones is determined by the renter
- EDP-levying of call charges (call charge units are counted seperately)
- telex
  use during business hours
  (charge units are counted seperately)
- remote copier
  use during business hours
  (charge units are counted seperately)
- copiers
  use at any time
  charges are levied by means of individual counters

use of premises:
small conference rooms (8 people)
large conference rooms (25 people)
(projection technique incl.)

office service:
- telephone service
- acceptance of short messages
- acceptance and passing on of the post
- receipt of visitors
- typewriting service
- borrowable dictaphones
- franking of the outgoing post

business hours: 8 a.m. - 6 p. m.
Mo.-Fr.

AG

I individual consultancy

1. consultancy for the foundation of enterprises

a) economic consultancy
- consultancy in all stages of the process of decision-making, be it planning, foundation or setting-up-time
- financial advice (financial aid, short and medium-term financing concepts, profitability)
- the planning of management strategy, organisation, line of products
- management team
- marketing

b) technical consultancy
- analyses of the state of technology (data bank enquiries)
- analyses of the technological development problems of new products and processes
- information about patent rights

2. consultancy during the initial stages of the new enterprise

- business administration advice
- organizational advice
- literature, patent and technology enquiries
- additional technological consultancy
- information about patent rights
- analyses of the market
- marketing consultancy

AGIT

II group consultancy

- business management
(operations policy, management strategy, management and organizational structures, planning and information policy, successor of the entrepreneur)

- marketing
(potential markets, sales planning, price calculation, sales organization, sales promotion)

- organization
(management and rehabilitation organization, job description, operational procedures, office equipment)

- data processing
(analyses of functions, evaluation of the EDP systems in use, planning of EDP systems, collection and evaluation of offers, calculation of commercial efficiency, organizational integration)

- production
(production flow, capacity and quantity planning, intermediate storage, production control, flow of material)

- financial organization
(evaluation of the balance of account, analyses of profitability, financial planning, organization of financial accounting, salaries and wages, operational accounting, cursory income statement)

- labour management
(personnel requirements, payment, participation in profits, personnel rating, engagement of staff)

...

AGIT

- 2 -

- sales promotion
(development of advertising concepts, analyses of advertising media, planning of advertising and coverage programmes)

AGIT

The establishment of technology-based enterprises
- a pilot project of the Federal Minister for Research and Technology -

aim:
The aim ist o encourage the establishment of enterprises from technology areas with a promising future and to support the newly established enterprises

measures:
consultancies, constributions, risk sharing

application requirements:
only those people are eligible who want to establish a technology-based enterprise; technology-based enterprises, which are less than 3 years old and have less than 10 employees

stages to support

requirements on the part of the applicant
- personality
- description of the innovation
- reflections concerning the market
- technological data
- considerations concerning financing and marketing
- concept of the enterprise
- realization steps

- comprehensive programme to realize the plan
- detailed information concerning the sales prospects
- marketing conception
- cost budget and financing program

- prototype which is marketable and ready to go in mass production

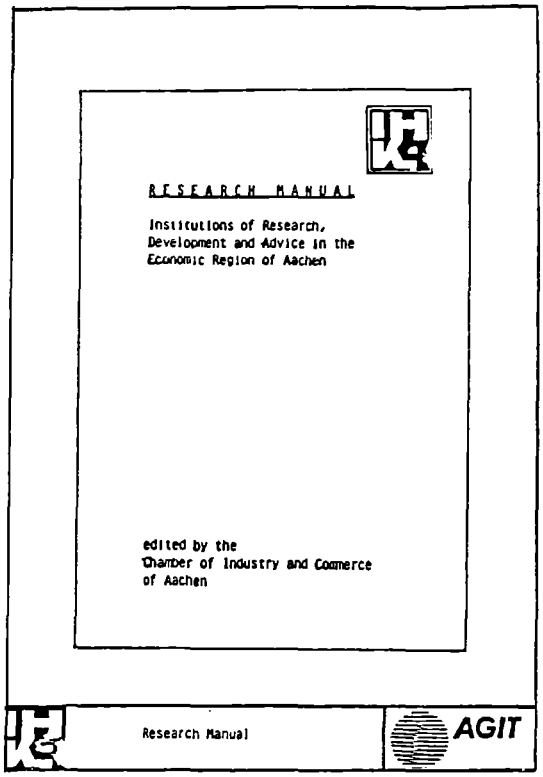
subsidies up to 75 per cent (5 000 DM at most)
a business conception is drawn up

subsidies up to 75 per cent (900.000DM at most)
development of the product

80 % bank guarantee (1.5 Mill. DM at most)
establishment of the production

productive enterprise

AGIT




Contract

The Chamber of Industry and Commerce of Aachen (in the following called chamber) - represented by its president, Dr. Heinz Malangré, and its managing director, Dr. Otto Eschweiler -

and

the Kernforschungsanlage Jülich GmbH (in the following called nuclear research plant) - represented by its board of directors -

conclude the following co-operation contract:

...

Contract

The Chamber of Industry and Commerce of Aachen (in the following called chamber) - represented by its president, Dr. Heinz Malangré, and its managing director, Dr. Otto Eschweiler -

and

the Fachhochschule Aachen (in the following called technical college) - represented by its chancellor, Prof. Dr.-Ing. Helmut Strehl -

conclude the following co-operation contract:

§ 1
The partner to the contract endeavour to give their support - within the bounds of possibility - to the consolidation and strengthening of the scientific-technological research capacity in the region and to procure research and development contracts.
Research cooperations between university institutes and enterprises of the private sector shall be made easier an the unhindered formation of project-teams made possible. The exchange of the personnel and jobs of the research and development staff is aimed at and an improved exchange of experience between the research scientists of the university and the development staff of the enterprises is aspired to.

...

The Chamber of Industry and Commerce of Aachen (in the following called chamber) - represented by its president, Dr. Heinz Malangré, and its managing director, Dr. Otto Eschweiler -

and

the Rheinisch Westfälische Technische Hochschule Aachen (in the following called university) - represented by its chancellor, Prof. Dr. G. Urban -

conclude the following co-operation contract:

§ 1
The partner to the contract endeavour to give their support - within the bounds of possibility - to the consolidation and strengthening of the scientific-technological research capacity in the region and to procure research and development contracts.
Research cooperation between university institutes and enterprises of the private sector shall be made easier and the unhindered formation of project-teams made possible. The exchange of the personnel and jobs of the research and development staff is aimed at and an improved exchange of experience between the research scientists of the university and the development staff of the enterprises is aspired to.

§ 2
In order to fill the technological gap in the domestic economy, research results of the university shall be elaborated to facilitate their applicabilities. For an appropriate consideration and as licensable technologies theses research results shall in particular be put at the disposal of small and medium-sized enterprises of the region. The problems and development plans of the regional economy shall in an appropriate form be included in the scientific research and development of the university institutes.

The contractors aspire to support the willingness to cooperate interdisciplinary and to reduce the ignorance of each

Curriculum Vitae

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Date of birth: 1951

1969 - graduation from high school
1974 - Degree at the Technical University of Aachen (RWTH)
1974/75 - working in industry
1976-82 - assistant lecturer at the Technical University of Aachen (RWTH)
1982-84 - working in industry
since
1984 - innovation adviser at the Aachen Chamber of Industry and Commerce

## The Experiences of a University Based Technology Transfer Office

Klaus Meeh

German Universities
- Relationship and differences from other institutions of the research and teaching system
- Figures
- Faculties

University Kassel
- The region
- Faculties
- Special institutions

The Technology Transfer Office
- Persons
- Typical Projects
- Clients
- Active acquisition
- Costs and who pays for them

Typical Projects for Mediumsized Industry
- Kind of firms
- Examples

THE UNIVERSITY SET-UP IN WEST GERMANY CAN BE DESCRIBED AS FOLLOWS:

- o ACADEMIC HIGHER EDUCATION: UNIVERSITIES AND TECHNICAL UNIVERSITIES (ALL DISCIPLINES), TEACHER TRAINING COLLEGES/EDUCATIONAL-SCIENCE COLLEGES (TRAINING FOR SCHOOL TEACHERS), THE POLYTECHNICS (COMBINE THE FUNCTIONS OF DIFFERENT TYPES OF HIGHER EDUCATION INSTITUTIONS; VARY FROM STATE TO STATE), THE OPEN UNIVERSITY IN HAGEN (POLYTECHNIC)

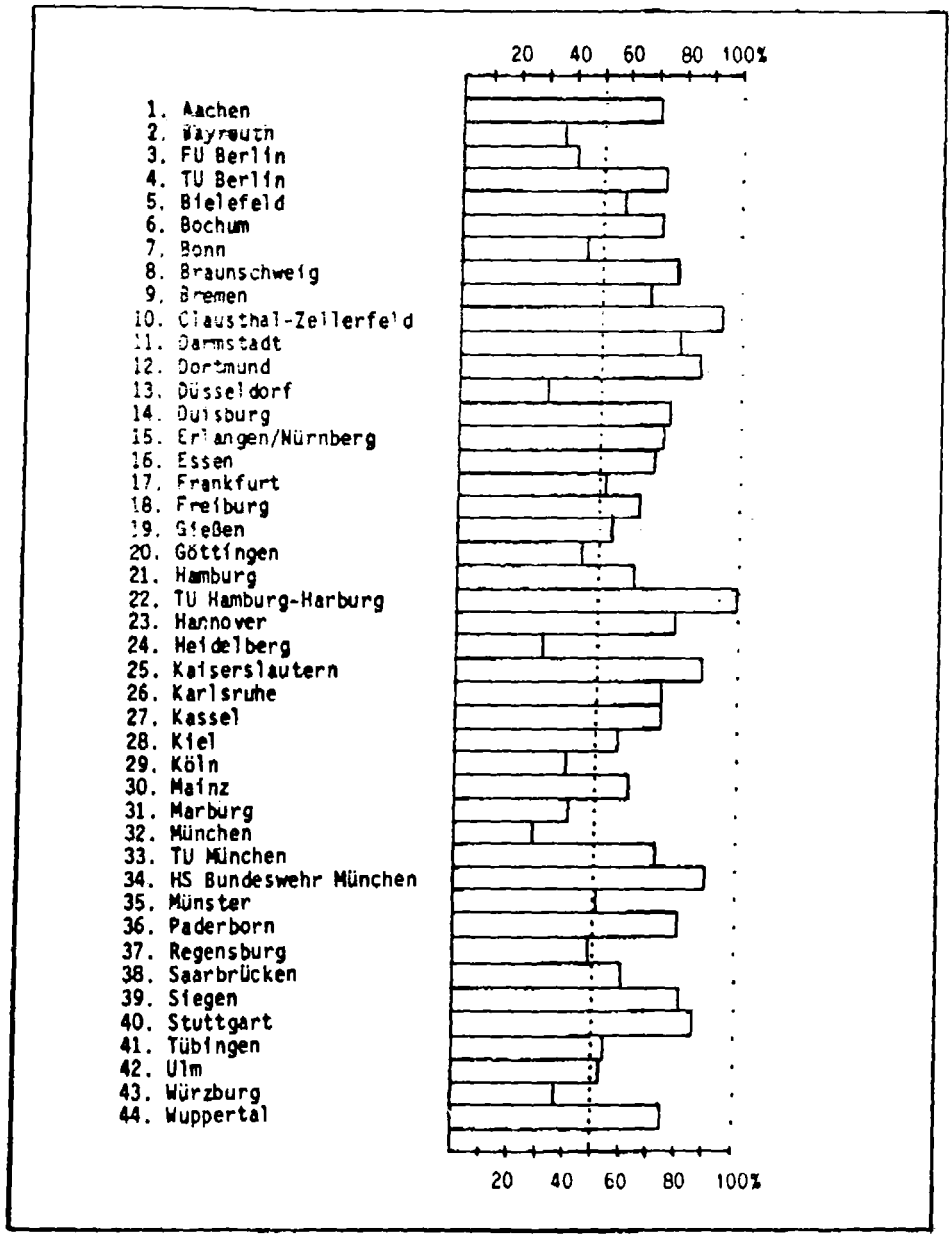
- o SPECIALIST COLLEGES: A TYPE OF HIGHER EDUCATION INSTITUTION WITH PRACTICE-ORIENTATED TRAINING

- o 'DEPARTMENT' COLLEGES: ESTABLISHED BY THE FEDERAL AND STATE GOVERNMENTS FOR THE TRAINING OF PUBLIC SERVANTS BELONGING TO SPECIFIC SERVICES

- o TECHNOLOGICAL COLLEGES: COLLEGES OF THEOLOGY

- o ART COLLEGES AND MUSIC ACADEMIES: COLLEGES OF ART AND MUSIC

PRACTICAL CONTACTS OF THE HIGHER EDUCATION INSTITUTION TUTOR, AFTER THE HIGHER EDUCATION INSTITUTIONS WERE CONSIDERED ONLY WITH A SUFFICIENT AMOUNT OF RETURNED QUESTIONNAIRES



THE SETTING-UP OF INSTITUTIONALISED ACADEMIC- AND TECHNOLOGY TRANSFERS IN THE UNIVERSITIES AND POLYTECHNICS IN WEST GERMANY
(STAND: APRIL 1987, SOURCE: PROWIS)

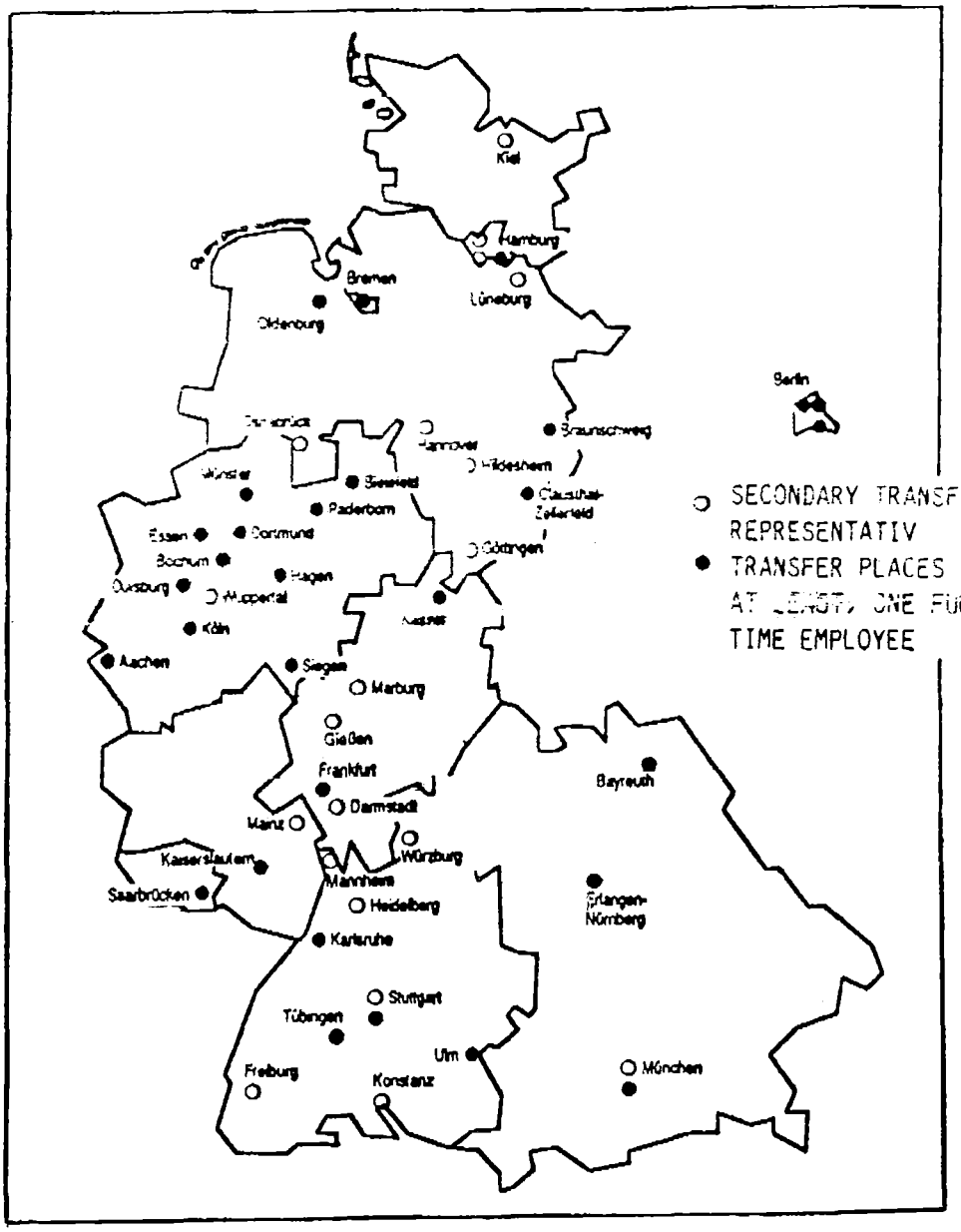
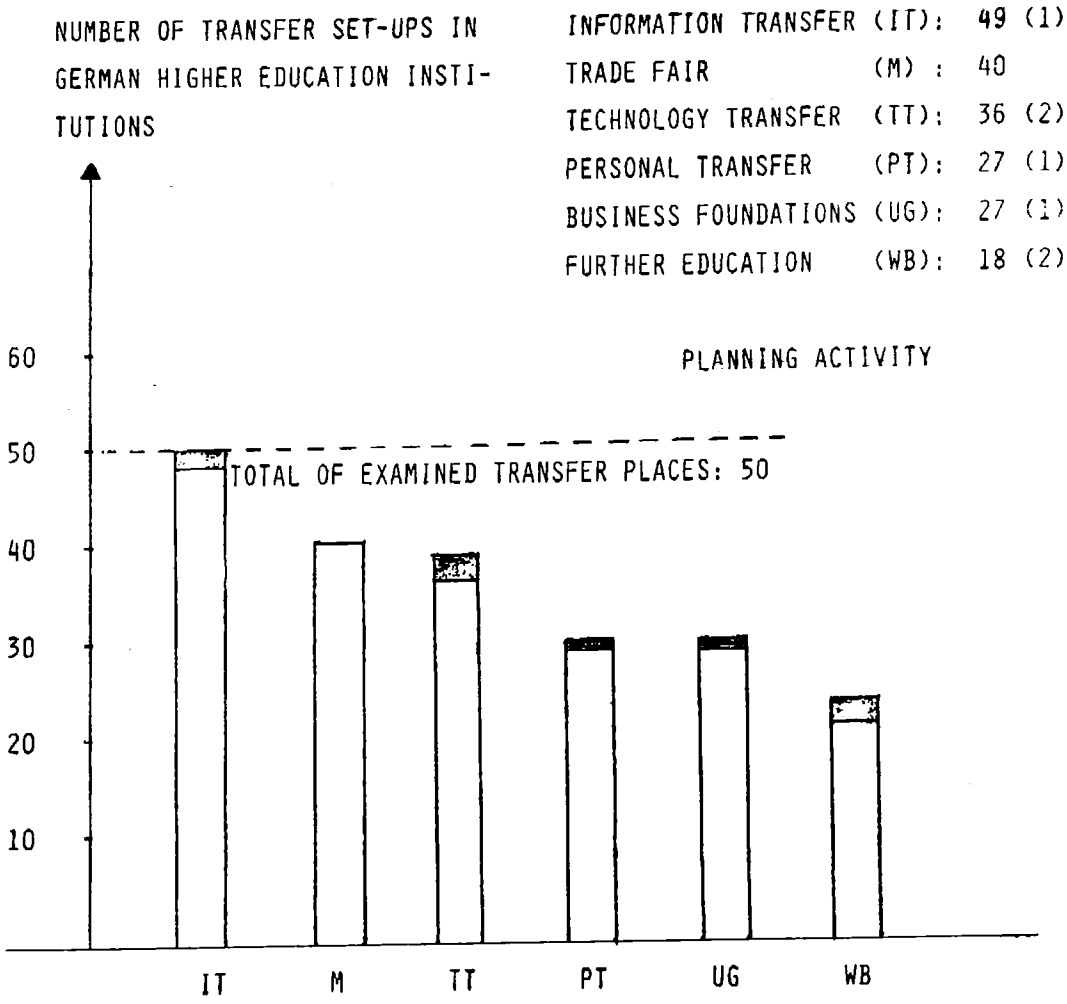
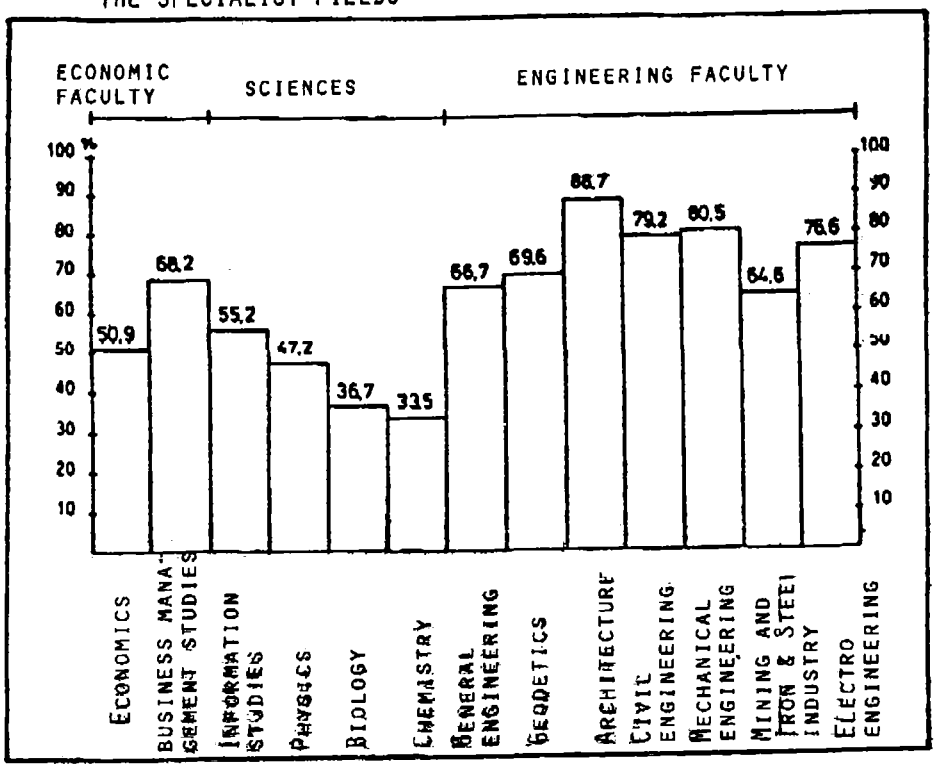


ABB. 2 B: AREA OF ACHIEVEMENT OF THE TRANSFER SET-UP IN UNIVERSITIES AND POLYTECHNICS
(SUMMARY. STAND: APRIL 1987. SOURCE: PROWIS)



PRACTICAL CONTACTS OF THE H. E. I. TUTOR FROM THE SPECIALIST FIELDS



## ASPECTS, WHICH ARE, WITH THE JOINT WORK BETWEEN UNIVERSITY AND ECONOMIC BUSINESSES, TO BE TAKEN INTO CONSIDERATION

IN WEST GERMANY THE UNIVERSITIES ENJOY A SPECIAL STATUS. THIS STATUS IS DETERMINED IN WEST GERMANY'S 'BASIC LAW'.

IN IT IS STATED 'FREEDOM OF RESEARCH AND TEACHING' (ARTICLE 5), I. E. THE UNIVERSITIES AND PROFESSORS ARE UNDER OBLIGATION ONLY TO SCIENCE AND TEACHING AND CAN, ACCORDINGLY, MAKE DECISIONS AUTONOMOUSLY ON THEIR RESEARCH THEMES.

FOR THIS TO BE GUARANTEED, THE REGIONAL AUTHORITIES ('THE FEDERAL GOVERNMENT' AND ITS 'LANDS') MUST SUPPLY THE MATERIAL AND FINANCIAL RESOURCES SO THAT THE INDEPENDENCE OF SCIENCE REMAINS GUARANTEED.

FROM THE 16,4 THOUSAND MILLION DM THAT, IN 1986, WAS SPENT ON THE GERMAN UNIVERSITIES' RESEARCH AND DEVELOPMENT WORK, AROUND 120 MILLION DM CAME FROM THE ECONOMY.

IN THIS RESPECT THE SHARE OF UNIVERSITY-RESEARCH AND DEVELOPMENT EXPENDITURE WHICH IS FINANCED BY THE ECONOMY, LIES AT AROUND ONLY 1,7 %.

THE JOINT WORK BETWEEN UNIVERSITIES AND ECONOMIC BUSINESSES CAN BASICALLY BE IMPLEMENTED IN 2 DIFFERENT FORMS.

### 1. JOINT WORK IN FULL-TIME DUTIES:

THE RESPECTIVE PROFESSOR OR INSTITUTION CARRIES OUT THE PROJECT IN THE FRAMEWORK OF THE AREA OF THEIR DUTIES.

THE FOLLOWING ARE OF IMPORTANCE:

- o CONTRACT PARTNERS ARE THE ECONOMIC BUSINESSES AND THE UNIVERSITY OR RESPECTIVE INSTITUTE.
- o THE RESPECTIVE PROFESSOR HAS NO RIGHT TO A PERSONAL HONORARY.
- o THE PROJECT MUST BE SHOWN TO THE HEAD OF THE COLLEGE (PRESIDENT), BUT DOES NOT NEED TO BE APPROVED AND CAN BE WORKED ON WITH THE UNIVERSITY'S RESOURCES.
- o THE PROJECT CONTENTS MUST BE BROUGHT INTO ACCORD WITH THE UNIVERSITY'S AREA OF RESPONSIBILITY. THAT MEANS, FOR EXAMPLE, DEVELOPMENT OF A PROTOTYPE THOUGH NO SERIES PRODUCTION.
- o THE INCOME, WHICH COMES FROM THE UNIVERSITY OUT OF SUCH CO-OPERATION, SHOULD IN ALL CASES BE USED ONLY FOR THE EMERGING EXPENDITURE (E. G. PERSONAL COSTS, EQUIPMENT).

WITH RESEARCH AND DEVELOPMENT CO-OPERATION BETWEEN UNIVERSITY AND ECONOMIC BUSINESS IT DOES NOT SELDOM HAPPEN THAT TECHNICAL DISCOVERIES FOR EXAMPLE, WILL BE MADE.

SO THE QUESTION CAN BE PUT WHO (UNIVERSITY OR CLIENT) PROFITS FROM THIS?

ON THIS MATTER THERE ARE LEGAL RULES WHICH ARE DEFINED IN THE 'LAW ON INVENTIONS' FOR EMPLOYEES.

THE LAW ON INVENTIONS FOR EMPLOYEES CONTROLS THE PROPERTY AND THE EXPLOITATION RIGHTS OF THE INVENTIONS (PATENT, REGISTERED DESIGN, TECHNICAL SUGGESTIONS FOR IMPROVEMENT) FROM EMPLOYERS AND ALSO FROM OFFICIALS.

INVENTIONS OF THE COLLEGE TUTORS ARE PERMITTED AS FREE INVENTIONS AND THE INVENTOR IS ENTITLED TO THEM, NOT THE COUNTRY (AND/OR FEDERAL GOVERNMENT).

BUT THE EMPLOYER (UNIVERSITY, STATE) CAN, AS FAR AS THE RESEARCH WORK GOES THROUGH WHICH THE INVENTION WAS MADE, USE SPECIAL MEANS TO CLAIM AN APPROPRIATE SHARE OF THE REVENUE OF THE INVENTOR.

THE EMPLOYER'S SHARE OF THE EXPLOITATION OF THE COLLEGE TUTORS (PROFESSORS) INVENTIONS HAS, IN PRACTICE, NO MEANING UP TO NOW.

THE SITUATION IS DIFFERENT FOR COMPANIES WHERE PROPERTY BELONGS TO THE COMPANY IF IT WAS DEVELOPED IN ITS LABORATORIES AND WITH ITS RESOURCES.

HOWEVER THE 'FREEDOM OF RESEARCH' AND THE ABOVE-MENTIONED (PROFESSOR'S) PRIVILEGE IS ONLY VALID FOR UNIVERSITIES (ECONOMIC COLLEGES, UNIVERSITIES, TEACHER TRAINING COLLEGES) BUT NOT FOR OTHER ESTABLISHMENTS E. G. TECHNICAL COLLEGES, NOR FOR OTHER PERSONNEL AT UNIVERSITIES.

ALSO INDEPENDENT RESEARCH INSTITUTES, SUCH AS THE MAX-PLANCK-SOCIETY, DO NOT HAVE THE PRIVILEGE (MAX-PLANCK-SOCIETY TAKES OUT THE PATENT AND THE INVENTOR GETS 30 % FROM THE LICENCE REVENUES).

## 2. JOINT WORK IN PART-TIME JOBS OUTSIDE OF HIS DUTIES AS A PROFESSOR:

PROFESSORS CAN BASICALLY FOLLOW THROUGH CO-OPERATION PROJECTS WITH ECONOMIC BUSINESSES IN PART-TIME JOBS.

THROUGH THIS, UNAUTHORIZED PART-TIME JOBS (E. G. SCIENTIFIC JOBS AND EXPERT JOBS AND THOSE REQUIRING OFFICIAL APPROVAL CAN BE DISTINGUISHED.

SCIENTIFIC PART-TIME JOBS AS SUCH, OR JOBS REQUIRING INDEPENDENT EXPERTISE NEED NO OFFICIAL APPROVAL.

THEY ARE, HOWEVER, NOTIFIABLE.

SCIENTIFIC PART-TIME JOBS OR JOBS WHICH ARE PRACTISED UNDER, OR WITH USE OF PERSONNEL FROM THE UNIVERSITY ARE REQUIRED TO HAVE OFFICIAL APPROVAL, AND FOR THE DEMANDS ON THE UNIVERSITY RESOURCES COMPENSATION HAS TO BE MADE.

WITH THIS, THE PROFESSOR HAS TO WATCH THAT THE EXTENT OF HIS SECOND JOB DOESN'T DETRACT FROM HIS NORMAL DUTIES.

IN THIS CONNECTION A SECOND JOB WOULD BE PERMITTED IF THE TIME DEMANTS FOR IT ARE NOT MORE THAN 1 DAY A WEEK.

KASSEL UNIVERSITY

CITY OF KASSEL

- o C. 250.000 INHABITANTS
- o C. 1 MILLION IN THE CATCHMENT AREA
- o HEADQUARTERS OF THE COUNTRY'S SOCIAL AND WORKING LAW COURTS
- o CITY OF THE 'DOCUMENTA' - INTERNATIONAL EXHIBITION FOR MODERN ART
- o A REMARKABLE FEATURE OF THE SURROUNDING AREA OF KASSEL IS ITS RICH, QUITE MOUNTAINOUS, WOODLANDS
- o WELL-KNOWN ART EXHIBITION OF THE OLD EUROPEAN MASTERS'
- o RICH IN ITS AMOUNT OF HISTORICAL BUILDINGS AND MONUMENTS
- o DOMAIN OF THE STORY-TELLERS 'BROTHERS GRIMM'
- o ECONOMIC PROBLEMS STRUCTURALLY WEAK REGION
- o UNEMPLOYMENT RATE C. 14 %

- FOUNDED 1971
- 24 FACULTIES
- 3 INTER-DISCIPLINARY WORKING GROUPS
- 3 SCIENTIFIC CENTRES
- A CONTACT PLACE FOR FURTHER SCIENTIC EDUCATION
- OVER 10.000 STUDENTS - MAIN FOCUS - ENGINEERING - NATURAL SCIENCES AND ECONOMICS

## Reasons for the Technology transfer

Scientific technological work engineering education, and technology transfer through cooperation between scientists and industry are traditional tasks of universities.

Industry-university collaboration, therefore should not be considered an invention of our time.

If we have been talking more in the last five years about the organized transfer of technology from universities

- o new groups that are interested in acquiring the technology, e.g. small and medium sized enterprises new technology-orientated enterprises, community and social organizations, civic groups, unions
- o contents, e.g. acceptance of technology and its consequences technology assessment
- o extent e.g. management of product and process innovation

The organised University Technology transfer will become an original (new) efficient service of the University.

## TECHNOLOGY AND INNOVATIONS CONSULTANCY (TIB)

AIM:

THE TECHNOLOGY AND INNOVATIONS CONSULTANCY IS A CENTRAL SERVICE AREA OF KASSEL UNIVERSITY.

THE TASK OF THE TECHNOLOGY AND INNOVATIONS CONSULTANCY IS TO MAKE ACCESSIBLE THE KNOW-HOW OF THE TECHNICAL AND NATURAL SCIENCES, AND ALSO THE ECONOMICS AND SOCIAL SCIENCE FACULTIES, TO COMPANIES AND OTHER INTERESTED INSTITUTIONS BY USEFUL FORMS OF CO-OPERATION.

THROUGH CO-OPERATION THE FOLLOWING AIMS ARE ACHIEVED:

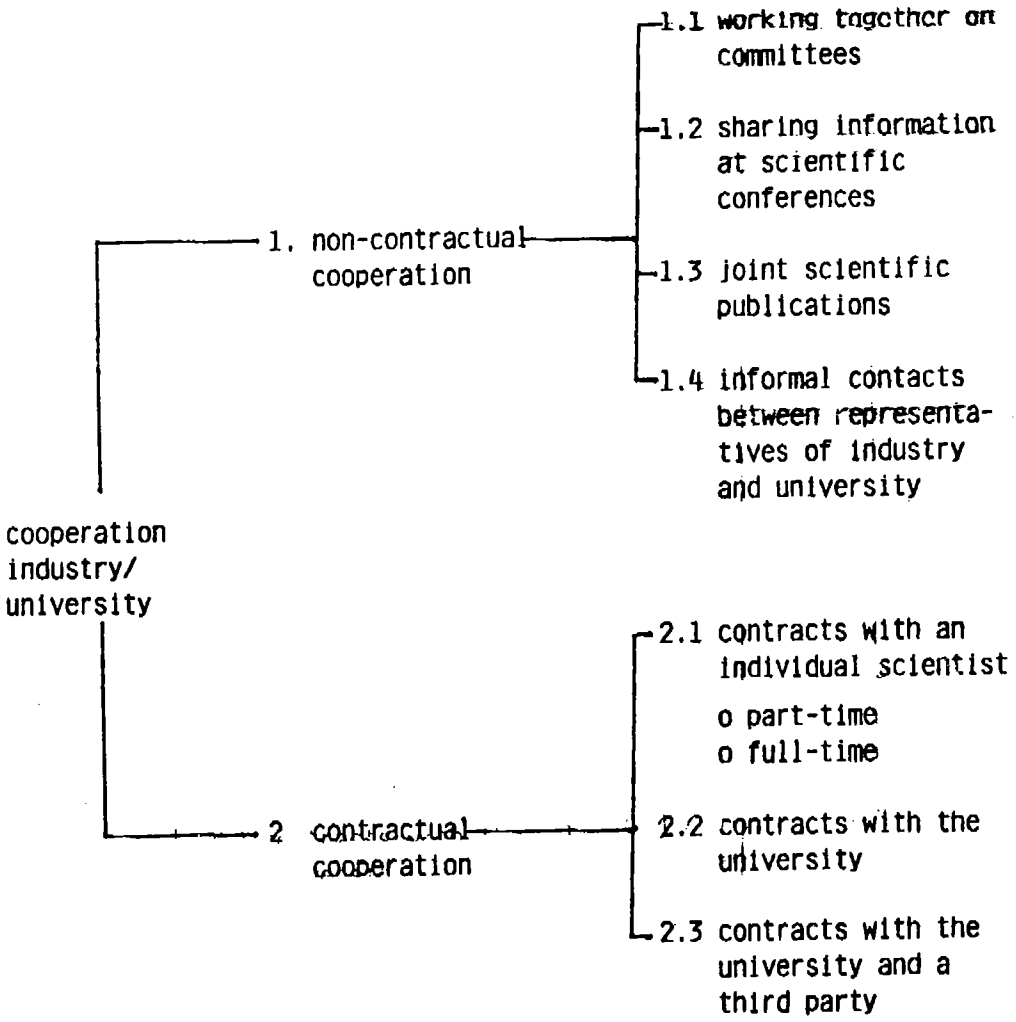
- o SOLUTION OF SPECIAL PROBLEMS IN PRACTICE AT THE UNIVERSITY
- o IMPLEMENTATION OF UNIVERSITY RESEARCH UP TO THE NEW PRODUCTS AND PROCEDURES
- o STIMULATION OF FURTHER AND COMMON RESEARCH AND DEVELOPMENT.

THE TECHNOLOGY AND INNOVATIONS CONSULTANCY MAKES IT EASY FOR AIMED ENTRY INTO THE VARIOUS AREAS OF THE UNIVERSITY.

THIS IS, IN PARTICULAR, AN ESSENTIAL SUPPORT FOR SMALL AND AVERAGE-SIZE COMPANIES.

## Forms of Technology transfer between University and Industry

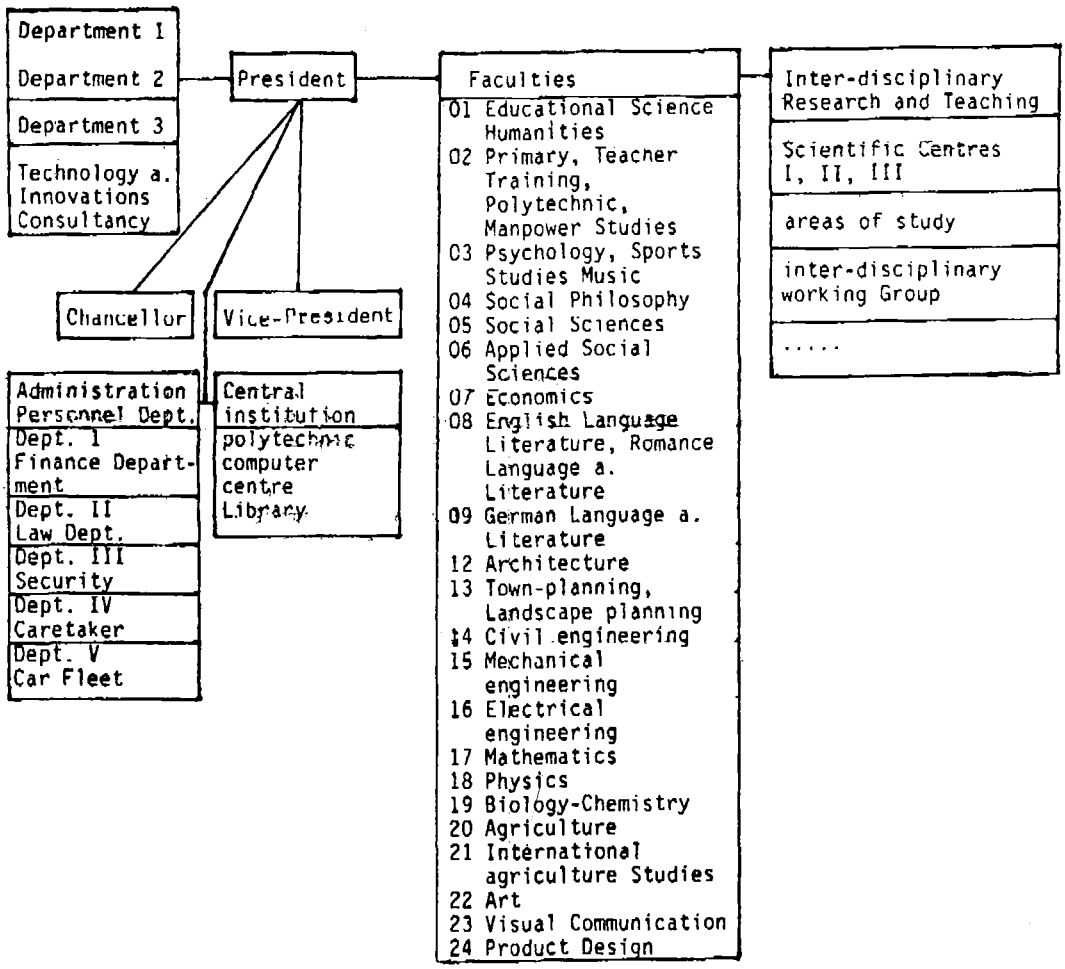
Collaboration between industry and the university can be structured in various ways:



Dept. I
Public Relations Dept.

Dept. 2
Student advisory service

Dept. 3
Contact place for scientific further education




Organisation of the Technology and Innovation Consultancy of the University.

## Reasons for the Technology transfer

Many firms, especially small and medium-sized enterprises faced with increasingly rapid technical economic and social changes need help to solve technical und economic problems.

Growing national and international competition is forcing industry to develop new products and services (product innovation) and to improve the management and technological process (process innovation).

In most of the small and medium-sized enterprises there is no research and development. Technology transfer is a great help in the process of innovation.

## Technology transfer for who ?

Technology transfer takes place between various partners:

- o between scientific institutions (e.g. universities) and industry
- o between different enterprises
- o between industries in different countries

In what follows I will be speaking only about cooperation between university and industry.

o Counselling concerning the establishment of new technology orientated enterprises

In most of the industrial nations in Europe the economic situation in recent years has been characterized by small or even stagnant growth and reduction of jobs, especially in traditional industrial sectors. Therefor the university will promote new technologies in new enterprises by

- consultation in management, marketing and finance
- training programs
- "founders round table" meetings
- cooperation with the center for new technology-orientated enterprises in Kassel

# Technology transfer in Kassel

Ways and means of technology transfer:

o Technology transfer

In the original sense technology transfer means the management of cooperation projects between enterprises and scientists. This can take different forms, for example

- research
- research under contract
- development
- development under contract
- licencing
- research cooperation
- consulting
- studies
- analysis

o Information transfer

Information is an essential raw material for maintaining competition in our country and world wide. We work in different areas, such as:

- information service
- research and data-banks
- exhibitions and fairs
- scientific meetings
- catalogues of all scientists and institutions offering
- specific services and products

Personal transfer

Technology transfer is always tied to people who transfer that particular knowledge into action. The best technology transfer is there are the transfer of people. The following means are used to achieve this:

- work-study programs
- exchange programs for scientists

| | Technology transfer in Kassel | Technologie- und Innovationsberatung |
|---|---|---|

The Technology and Innovation Counselling Office of the University of Kassel comprises four essential areas:

- technology transfer, i. e. research, development counselling studies, analysis
- information transfer and education
- personal transfer
- counselling concerning the establishment of new technology-orientated enterprises

| Datum | | Blatt von |
|---|---|---|

| | Reasons for the Technology transfer | Technologie- und Innovationsberatung |
|---|---|---|

Many firms, especially small and medium-sized enterprises faced with increasingly rapid technical, economic and social changes need help to solve technical und economic problems.

Growing national and international competition is forcing industry to develop new products and services (product innovation) and to improve the management and technological process (process innovation).

In most of the small and medium-sized enterprises there is no research and development. Technology transfer is a great help in the process of innovation.

Hypothesis of Technology transfer and Innovation Consultation to Management and Organisation through Universities

Hypothesis 1:
Traditionally Technology transfer and Innovation consultation has always been perceived as being done in all Colleges and Universities in various forms and therefore it is nothing new for them, what is entirely new is the recent organisational planned approach. With this, Technology transfer does not remain merely a connection between predominantly large enterprises and a few institutes within successful Universities, but rather in the sphere of the partner within and also outside of the University will be consciously enlarged. The single, as well as economical effect of the Technology transfer shall, in essence, be increased.

Hypothesis 2:
Under the Technology transfer the planned, time-limited, volontary transfer of Technology from one partner to another should be understood. Technology transfer - linked with an Innovation Consultancy - is therefore a means to an increase of the economical use of research and development. Technology transfer can move across the chain from basic research, across applied research to development and applied techniques (vertical transfer) or on to the level of one of the chain links, i. e. within the basic research, applied research or development (horizontal transfer).

Under Technology all material and immaterial types of products and technical procedures ought to be understood. Universities are in the position to carry out Technology transfer in the above, complete way.

Hypothesis 3:
From the University research, the resulting publications serve, in the first place, the scientific reputation of the author and are rarely useful, immediately to work as initiators of Technology transfers particularly in a vertical direction. Here an additional working initiative function is essential.

Hypothesis 4:

Technology transfer through Universities need - if an expansion is desired - as a rule during the complete transfer process much support from the technology giver as well as from the Technology user. An active control in the form of combined problem solutions is necessary, i. e. the partners must be led together towards one aim. This applies, as well, if the transfer process is triggered by the market-force, as well as by initiation through the Research and Development area. The founding of Consultancy places as support for both partners of the transfer process has proved its worth in the above-named sense. These Consultancy places enable the organisation of the Technology transfer and have a strong promotional function.

Hypothesis 5:

Technology transfer presupposes

- that the Technology giver is prepared and in the position to transmit all material and immaterial aspects of the technology and
- that the Technology user is able and prepared to manage the necessary adaptation process of the Technology transfer. So that the University Technology transfer is at its optimum, the Consultancy place has to check, in the first place, if the Technology is "ripe" for the transfer, i. e. that it has the necessary level of development, and if the Technology user is able, from the basis of the outgoing development level, to use the results. Here it is necessary to check the
  - personal qualifications and consequences
  - capital provision
  - Disposal of technical and market information
  - organised requirements

for the adoption process. Technology transfer leads therefore to an Innovation Consultancy.

Hypothesis 6:

Technology and Innovation Consultancy through Colleges and Universities still have the following problems:

- Both partnes use different languages
- Contact shyness of the enterprise with regard to the scientific area
- Conflict shyness of the scientist

- No specific sensitizing for the special problems of small and middle-sized enterprises
- different planning process in the University and the Economy
- Administrative hindrances in scientific departments
- etc.

Consultancy places must know, in their function as moderators, these problems and reservations and should be in the position to bring the partners into agreement.

Hypothesis 7:
University Consultancy places have, besides the named function as moderators, a co-ordinator function, i. e., to produce the requirements so that the Transfer process won't be hindered or made more difficult by irrelevant factors, eg. administrative obstacles. Good teamwork with the scientific departments is required. The Consultancy place must be co-ordinated between scientist and administration.

Hypothesis 8:
Technology transfer and Innovation consultancy should not be a one-way street to the outside, i. e., the Consultancy places have an essential catalyst function. The experiences with the transfer process are to be incorporated and constructively set up in the scientific area. This organised feed-back process helps to guarantee to meet the training demand and build up research areas of basic or future importance.

Hypothesis 9:
Technology transfer in particular from Universities in the peripheral fringe positions, has to be seen as an element of active regional policy. This signifies that the Consultancy places in such Colleges and Universities keep aimed contact with the companies, administrations and communities in the region.

Hypothesis 10:
Technology transfer has to be seen from responsible Universities also as a structural and economic policy instrument. This means that the main focus is to talk to small and average-sized enterprises. This requires an active instrument of support in the form of a Consultancy place, which is also able to take over the complete project management in combined problem solutions.

Big companies, or towards research-orientated small and average-sized business, University Technology transfer must also function in the sense of an "extended workbench", i. e. to confront the decision process, self-research and foreign research.

Hypothesis 11:
Technology transfer and the supporting Consultancy places have to show the highest measure of flexibility and work in an innovative and stimulating way. Consultancy places which are "quiet" don't fulfill their function. This demand must correspond to the organised construction. A narrow binding in the University's organisational structure, in the Research administration with its budgetary and personal rights restructions and other lengthy, frequently politically dominating, decision process of the University, cripples the initiatives and the working scope in the long run. A narrow, all too strong, binding in the University department hinders the work. An organisational tie to the University is a better solution.

Consultancy places should consequently be put under pressure because of the above mentioned organisational regulations, through a financial mix in the form of basic financing and shares in the projects.

Hypothesis 12:
Consultancy places for the Technology transfer and Innovation consultation should not remove themselves from the responsibility at the completion of projects i. e. a drawing back of a pure "intermediary function" doesn't fulfill the purpose. Consultancy places have to be prepared and in the position to bear project responsibility towards business as well as scientists.

RKW

YOUR PARTNER

IN BADEN-WÜRTTEMBERG

# THE EXPERIENCE OF A REGIONAL SMALL BUSINESS COUNSELING AGENCY

**Dr. Albrecht Fridrich**

INDEX

The Rationalization Board (RKW)

## THE RKW - A SYNOPSIS

- Founded 1921
- Registered, non-profit making organ
- Employers, trade unions and state on the board of directors
- 8 000 members firms, individuals and institutions
- Close co-operation with chambers trade confederations and institution
- Co-operation with similar institutions
- RKW-divisions in each German state
- Headquarters in Eschborn near Frankfurt

RATIONALISIERUNGS-KURATORIUM DER
DEUTSCHEN WIRTSCHAFT E. V.

- CONSULTANCIES
  - 1 200 consultancies per year
  - Co-operation with 150 industrial consultants and consulting agencies
- CONTINUING EDUCATION
  - 6 000 participants per year
- INFORMATION
  - 450 topical publications per year
- PROJECTS

The RKW is one of the largest organisations offering consultancy, continuing education and information in conjunction.

- Within the framework of the program for the promotion of the economy of the state of Baden-Württemberg the RKW has been commissioned to carry out consultancies in small and medium-sized businesses, for example
  - consultancies on general rationalization,
  - consultancies on the setting up of businesses,
  - consulting aid on export issues,
  - formation of joint venture groups,
  - consultancies on technology,
  - support on environmental issues affecting companies.

- The RKW Baden-Württemberg offers, in co-operation with the working committee of the Chamber of Commerce and Industry, various consultancy programs for small and medium-sized companies.

- There exists a close co-operation with the Fraunhofer Society, the Steinbeis Foundation as well as several universities.

- In the area of consultancy the RKW works closely with the Landeskreditbank Baden-Württemberg.

PRINCIPALS

- The company to be consulted is analysed extensively concerning structure, development and competitiveness.

- The primary and uppermost problems are localised.

- Realistic, economical, appropriate and up-to-date solutions are offered and realized.

- Professional qualifikation, experience and personal suitability of the individual RKW expert are utilised for the diverse manifestations of the various entrepreneurial activities.

TYPES

- GENERAL CONSULTANCY
  - Critical analysis of the entire company in the areas of technology and commerce.
  - Localisation of weak links and rationalisation possibilities in all operational areas.
  - Proposals for the removal of localised flaws.
  - Drawing up of a rationalisation program in order of importance (step-by-step program).
  - Assistance with the execution of the proposed solutions.
- SPECIALISED CONSULTANCY
  - Concentration on one operational area.
  - Effects on neighbouring areas are taken into consideration.

TYPICAL CONSULTANCIES

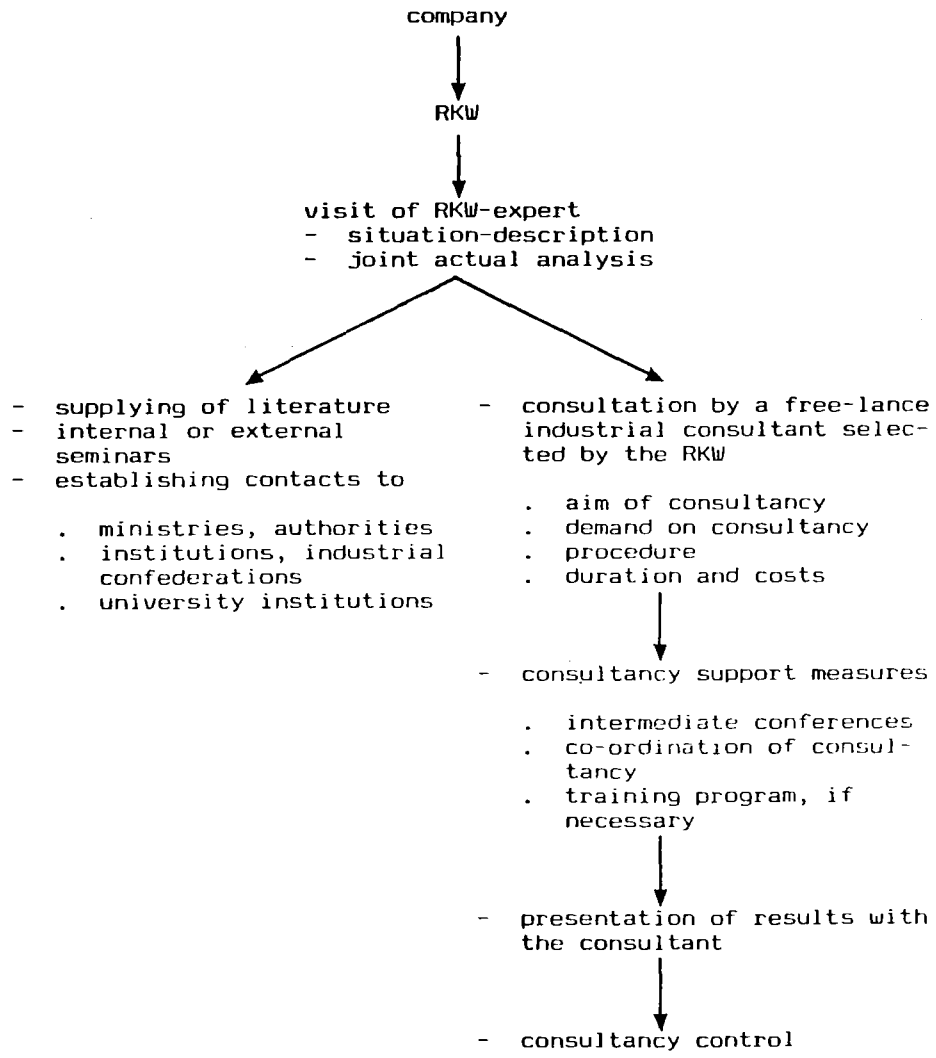
- Analysis: procedures and organisational structures are recorded according to content and data volume.

- Concept: aims are formulated, proposals are worked out, individual measures are planned.

- Implematation: within the framework of a step-for-step program in close co-operation with executives; training programs can be integrated.

- Further development: after a test phase the results are examined critically and, if necessary, corrective measures implemented.

PROCEDURE


company
RKW
visit of RKW-expert
- situation-description
- joint actual analysis
- supplying of literature
- internal or external seminars
- establishing contacts to
. ministries, authorities
. institutions, industrial confederations
. university institutions
- consultation by a free-lance industrial consultant selected by the RKW
. aim of consultancy
. demand on consultancy
. procedure
. duration and costs
- consultancy support measures
. intermediate conferences
. co-ordination of consultancy
. training program, if necessary
- presentation of results with the consultant
- consultancy control

AREAS OF OPERATION

- Management
- Marketing
- Organisation and data processing
- Production and technology
- Materials
- Export
- Technological science
- Environment

- Co-operation
- Founding new companies
- Technology-orientated founding of firms (TOU)

The task of the RKW technology consultancy is to support medium and small-sized companies in Baden-Württemberg in

- developing new or better products and manufacturing techniques,
- successfully market introduction of innovations

with

- independent judgement of technical development in regard to the situation of the company and the market,
- advice for planning and introducing new market orientated products to secure the future of the company,
- problem orientated informations to invigorate the innovation potential,
- advice for market introduction of innovations.

SUBJECTS OF CONSULTANCY

- Research (literature, licences, patents)
  - new technology
  - market trends
- Search of ideas
  - diversification
  - new products
- Solving of special problems
  - providing of know-how
  - consultation by experts
- Organizational help
  - financial capabilities
  - management methods
  - technology-management
- Marketing
  - sales possibilities and risks
  - coming on the market with a new product
  - sales organization

MAIN POINTS OF THE RKW TECHNOLOGY CONSULTING

- Providing of know-how
  - engaging experts from science, industry and administration
- Financing
  - public financing (application)
  - venture capital
- Marketing
  - chance-/risk analysis
  - market information/analysis
  - market possibilities
  - marketing conceptions
  - addition of technology to strategic planning
  - realizing of conceptions
- Controlling
  - cost accounting
  - calculation
  - budget
  - systems of information

- Medium-sized companies with up to 1 000 employees
  - all branches of the manufacturing industry
  - service industry
  - transport industry
- Public institutions

- CONSULTANCIES ACCORDING TO BRANCHES OF INDUSTRY (1987)

  - Manufacturing sector 81 %
  - Service industry 8 %
  - Building industry 6 %
  - Retail, transport, other 5 %

- CONSULTANCIES ACCORDING TO DEPARTMENTS (1987)

  - Management 39 %
  - Finance and Accounts 24 %
  - Sales and Marketing 11 %
  - Office and Administration 10 %
  - Technology and Manufacture 9 %
  - Materials 5 %
  - Personell and Labour 1 %

- CONSULTANCIES ACCORDING TO NUMBER OF EMPLOYEES (1987)

| | |
|---|---|
| - 1 - 19 | 56 % |
| - 20 - 49 | 26 % |
| - 50 - 199 | 16 % |
| - 200 - 499 | 2 % |
| - > 500 | 1 % |

TERMS

- Work done by RKW employees is free of charge.

- Expenses are incurred only for the activities of a free-lance consultancy specialist; a subsidised consultancy costs DM 850 per day, according to the following regulations:

  - subsidy of DM 280 per day for firms with a turnover of up to DM 9 million,

  - total possible subsidy of DM 7 500 up to 1990,

  - additional special programs for environment protection and co-operation consultancies,

  - special additional programs for Baden-Württemberg.

- For consultancies which are not subsidised by the state market prices are taken as a basis for fees.

- RKW members receive consultancies at reduced fees.

- EXTERNAL
  - Seminars, workshops, courses, study groups
  - Topics orientated to industrial management and technological organisation
- INTERNAL
  - Adapted to the individual needs of the company
  - Specialised topics
    - . methods of management
    - . techniques of leadership
    - . value analysis
    - . sales
- PERSONNEL DEVELOPMENT AND CONTINUING EDUCATION CONSULTANCY
  - Setting up and implementation of personnel development systems
  - Development of continuing education concepts
  - Counselling on request

- Evaluation of the important German-language literature from specialised publishing houses.

- Specific individual information in reply to written, telephone or personal requests.

- Publications

  - "Wirtschaft & Produktivität" (Economy and productivity), monthly magazine of the nation-wide RKW

  - "Mitteilungen", monthly bulletin of the RKW Baden-Württemberg

  - Books and leaflets from the RKW publishing house

  - Literature overviews on topical practical themes

  - Magazine information service

CO-OPERATION WITH RKW - HOW YOUR FIRM CAN BENEFIT

CONSULTANCY - CONTINUING EDUCATION - INFORMATION

are our specialised areas of operation. One is as important as the other. We can combine these areas of operation - for your benefit. That is our strength. The requirements of medium-sized companies are familiar to us from uncounted consultancies and seminars. Our aim ist the drawing up of practical and easy-to-realise solutions.

- We are a neutal, objective and reliable partner.
- We help you with a clear definition of the problem and suggest workable solutions.
- We have a thorough knowledge of the consultancy market; that entails a minimised risk for you when choosing a consultant and considerably shortens the selection process.
- We can establish interesting contacts to other firms, authorities and institutions. We can arrange visits and help you to find co-operation partners.
- With internal and external seminars we support your employee qualification schemes. Our specialised continuing education team can help you in all questions of continuing education.
- We can supply your experts with specialised information and publications from the RKW publishing house.
- After the completion of the consultancy or training program our experts will still be there to help you in our consultancy control program.

RKW

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| | |
|---|---|
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VICE-CHAIRMEN:

| | |
|---|---|
| Dr. Siegfried Müller | Industry |
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Consultancy Market

THE CONSULTANCY MARKET IN GERMANY

- Consulting agencies active on an international scale (e.g. McKinsey, Boston Consulting Group, Booz-Allen & Hamilton)
- Consulting agencies active on a national scale (e. g. Kienbaum, Baumgartner, Berger, Höfner)
- Consulting agencies active on a regional scale
- Individual consultants
- Banks and their consulting agencies (e. g. German Society for the Consulting of small and medium-sized Businesses, IKB Consult GmbH)
- Central Trade Associations, Chambers of Trade (promoted institutionally)
- Federation consulting departments (DIHT, IHK'n, BDI, BDS, BBE ...)
- RKW Consulting agency

## TYPES OF CONSULTING AGENCIES

- Intellectual "adventurers"
  (e. g. Arthur D. Little, Battelle Institute)
  - procede scientifically
  - develop far-reaching, fundamental solutions

- Strategic navigators
  (e. g. Boston Consulting Group)
  - offer a basis for decision for the future development of the company
  - present the results in the form of impressive models

- Management doctors
  (e. g. McKinsey & Company)
  - analyse the company
  - conduct feedback talks to identify the weak points

- System architects
  (e. g. Arthur Andersen, Booz-Allen & Hamilton)
  - the technicians among the consultants
  - develop and install new management systems

- Friendly co-pilots
  (frequently ex-managers)
  - function as advisers in difficult decision processes
  - usually establish a long-term trust relationship with the entrepreneur

WHY IS THE CHOICE OF CONSULTANT DIFFICULT?

- A precise identification of the problems is often lacking.

- Consultant/consultancy market
  - lack of market transparency
  - unfamiliarity of dealings with consultants
  - unawareness of performance level
  - insufficient insight into working methods
  - no appreciation of fee structure - the choice of consultant is therefore
    . more or less accidental
    . frequently emotionally conditioned
    . not always related to the concrete problem
    . based repeatedly on recommendation

- A consultancy is individual and geared to the needs of the company seeking advice; standard solutions are therefore in most cases unsuitable. References about similar cases are not applicable to the individual case.

IMPORTANT PREREQUISITES FOR A GOOD CONSULTANT

- Specialized knowledge
- Specialized experience
- Familiarity with branch of industry concerned
- Methodological abilities
- Negotiating ability
- Power of persuasion
- Objectivity, integrity, respectability
- Practical experience in the realization of solutions, assertiveness

Co-operation with Consultants

- The problem to be solved cannot be clearly identified from within the company itself.

- The problem to be solved has been fundamentally identified but differences of opinion at managerial level prevent a solution.

- The problem is so extensive that, because of the necessities of daily business, the management has no time for a systematic solution.

- The problem requires expert knowledge, specialized abilities as well as extensive experience, which are not sufficiently available in the company.

- Structuring and solving the problem require a degree of neutrality and lack of prejudice which is not present in the company.

INCREASINGLY COMMON PROBLEMS FOR COMPANIES AND THEIR CAUSES

- Growing market risks caused by shorter product life cycles.
- Increased competition, especially from abroad
- Increased dependency of companies on individual customers because of concentration processes.
- Growing problems with customer solvency due to rising numbers of bankruptcies.
- Increasing inflexibility of companies due to increasing fixed costs such as those arising from the regulations for the dismissal of employees and the increasing capital intensity.
- Dramatically sinking own capital resources.

AREAS OF ANALYSIS FOR THE EVALUATION OF COMPANIES

- Balance sheet
- Market
- Product
- Technologies
- Quality of management
- Future planning and prospects

EVALUATION OF THE SUCCESS OF THE CONSULTANCY

- Cost/effectivity relationship
  - effectivity
  - efficiency
- Satisfaction of the company after consultancy
- Realization of the suggestions

## RULES OF THE GAME FOR CONSULTANTS AND COMPANIES

### CONTRIBUTION OF THE CONSULTANT

- Definition of the problem
- Far-reaching, fundamental analysis
- Securing details
- Striving for a universal solution
- Demonstrating practicable methods
- Suggesting alternatives
- Proposing time schedule
- Motivating employees
- Informing about the conceptional background
- Refraining from evalutaion of employees

### CONTRIBUTION OF THE MANAGEMENT

- Continuous co-operation
- Being open to everything
- Checking hypotheses and details
- Keeping the whole company in mind
- Being ready to make decisions
- Keeping the aim in mind
- Defending the consultancy internally

- Consultants remain - whatever role they play - the advisers and partners of the companies. They and their analyses and reports are seldom met with enthusiasm.

- The large burden of time to be invested, up to the level of the board of directors, which is entailed by the employment of a consultant must be recognized and accepted from the outset.

- For consultants the "tough client" is preferable to the deferential customer - consultants have good nerves and can cope with opposition and contradiction.

Public Support Programs

STATE-SUBSIDISED CONSULTANCIES IN THE FEDERAL REBUBLIC OF GERMANY

"By recognising the maxim of help for beeing able to help yourself, parts of the costs created by consultancies are taken over by the state. Management consulting is an important instrument to increase the productivity and the competitiveness of small and medium-sized business."

- Institutional promoting

  - advisory body for craftsmanship (Zentralverband des Handwerks/Handwerkskammern).

- Promotion of projects

  - RKW

    Mainly the industriy, but also other branches of trade, receive consultation (to a small amount subsidies for personnel expenses are still being granted).

  - Free-lance program

    All commercial branches are beeing consulted (through following organisations: Chambers of Industry and Commerce, DIHT, BDI, BDS, BBG, BBE, Interhoga, DRV).

MAXIMUM TURNOVER TO RECEIVE STATE-SUBSIDISED GENERAL CONSULTANCY AND PERCENTAGE OF COMPANIES BELOW THIS MAXIMUM ACCORDING TO BRANCHES OF TRADE

| branch of trade | maximum turnover up to ... million DM | percentage of companies below this maximum |
|---|---|---|
| industry, craftsmenship | 9,0 | 96,2 |
| wholesale/ foreign trade | 13,0 | 91,6 |
| commercial agents | 1,0 | 94,2 |
| retail | 4,5 | 97,0 |
| transport industry (except travel agencies) | 3,5 | 99,3 |
| travel agencies | 2,0 | 94,2 |
| catering trade | 2,0 | 99,2 |
| remaining service industries | 2,0 | 96,6 |
| total | - | 95,8 |

Source: Bundesanzeiger, Richtlinien über die Förderung von Unternehmensberatungen für kleine und mittlere Unternehmen vom 06.12.1984; Statistisches Bundesamt, Umsatzsteuerstatistik 1984 as well as estimates of the Ifo-Institut.

EXTENT OF GRANTED GOVERNMENTAL SUBSIDIES FOR MANAGEMENT CONSULTATION *)

IN THE YEARS FROM 1980 TO 1986

ACCORDING TO PROGRAMS OF PROMOTION IN MILLION DM

| year | RKW | free-lance program | | craftsmanship | | total |
|---|---|---|---|---|---|---|
| | | total | among this for craftsmanship | own consulting organisation | own consulting organisation and promotion of craftsmanship out of free-lance program | |
| 1980 | 3,0 | 18,3 | 3,3 | 14,0 | 17,3 | 35,3 |
| 1981 | 2,6 | 17,7 | 3,3 | 14,8 | 18,1 | 35,1 |
| 1982 | 3,0 | 17,5 | 3,5 | 14,8 | 18,3 | 35,3 |
| 1983 | 3,0 | 27,1 | 3,9 | 15,2 | 37,4 | 45,3 |
| 1984 | 3,0 | 32,0 | 10,6 | 15,7 | 26,3 | 50,7 |
| 1985 | 3,4 | 24,0 | 3,5 | 16,3 | 19,8 | 44,2 |
| 1986 | 2,6 | 17,8 | 4,2 | 16,0 | 20,2 | 36,4 |
| 1980 - 1986 | 20,6 | 154,9 | 32,3 | 106,8 | 157,4 | 282,3 |
| % in 1980 | 8,5 | 51,8 | 9,3 | 39,7 | 49,0 | 100 |
| % in 1986 | 7,1 | 48,9 | 11,5 | 44,0 | 55,5 | 100 |

*) General consulting, consultation for the inception of an enterprise and consultation for securing the existence of an enterprise.

Source: Bundesministerium für Wirtschaft, Bundesamt für gewerbliche Wirtschaft.

EXPERIENCES WITH THE SUBSIDY OF CONSULTANCIES

- Primary consultation

  - Without government grants 80 % of the consultancies would not have taken place.

- Following consultation

  - Generally the consultations continue without any subsidies.

- Consultancies that are taken along with the reason of being state-subsidised.

- Indirect promotion of advisory boards.

# Yugoslav - German Seminar on Innovation Advisory Centres

## Plitvice, September 5 - 7, 1988

**Presentation by:**

**Michael Mayer**
**Fraunhofer Institut für Systemtechnik**
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**Breslauer Straße 48**

**D - 7500 Karlsruhe 1**

2.2

Firm Foundations

Branches of New Firms in Northrine Westfalia 1984

| | |
|---|---|
| Chemical Industry | 186 |
| Rubber and Plastics | 365 |
| Non-Metallic Mineral | 421 |
| Metal Manufacturing | 1,417 |
| Metal Goods, Engineering, Vehicles | 2,075 |
| Electrical and Electronic Engineering | 1,889 |
| Wooden Furniture and Manufacture of Paper Products | 1,749 |
| Textile Industry | 1,348 |
| Food, Drink, Tobacco | 1,482 |

2.3

Firm Foundations

New Firms with own R&D (Estimations based on public programmes)

- o about 300 new firms every year with own R&D
- o about 50 per cent with R&D expenses greater 200,000 DM
- o about 25 per cent with continued R&D over at least 5 years

3.1

Experimental Programme Support of High Technology Based New Firms (HTBNF)

Aims of the Programme

- o Create an atmosphere encouraging founders of HTBNF
- o Elaborate and test instruments for effective management assistance
- o Stimulate banks and venture capital companies to invest in early stages of HTBNF
- o Learn about the needs of growing HTBNF

3.2

Experimental Programme HTBNF

Financial Support

Three Stages

Stage I

- Subsidy for costs of external expertise

Stage II

- Subsidy for costs for the development of a product

Stage III

- Guaranty for a bank loan to finance expenses for preparation of production and marketing

3.3

Experimental Programme HTBNF

Promotional Approaches: Beneficiaries and consultancy

Regional Approach
- o Firm founders in six selected regions
- o Regional Technology Advisory Agency (TAA)

Technology Approach
- o Founders of firms dealing with microelectronics or biotechnology
- o Institutions in charge of Federal Government Programmes on these technologies

Innovation Centre Approach
- o Firm founders in 14 selected innovation centres
- o Management of the centres

Venture Capital Approach
- o Firm founders with participation of a Venture Capital company
- o Venture management team

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**Fraunhofer Institut für Systemtechnik**
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**Breslauer Straße 48**

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| APPROACH | STARTING POINT | TECHNOLOGY TRANSFER AND SUPPORT OF COMMERCIALIZATION |
|---|---|---|
| BIG SCIENCE | LARGE SCALE RESEARCH INSTITUTIONS MAJOR INDUSTRY | R&D CONTRACTS SECONDARY EXPLOITATION OF INVENTIONS |
| KEY TECHNOLOGIES | INDUSTRY, CONTRACT RESEARCH ESTABLISHMENTS | R&D CONTRACTS EXPLOITATION OF INVENTIONS |
| DIFFUSION RATIONALIZATION | INFRASTRUCTURE SME | STAFF TRANSFER ADVISORY SERVICES EXPLOITATION OF INVENTIONS |
| NEW INDUSTRIES | NEW AND YOUNG TECHNOLOGY BASED FIRMS | INCUBATOR UNITS RISK CAPITAL CONSULTANCY |

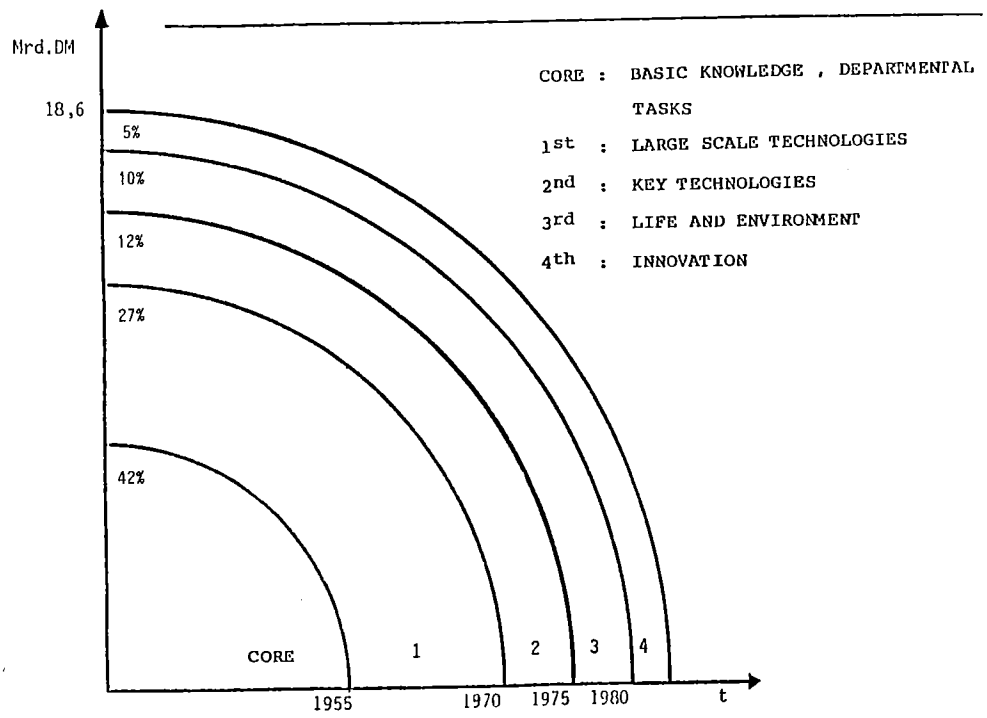
## NATURAL TRANSFER OF KNOWLEDGE AND TECHNOLOGY BY SOURCES OF KNOWLEDGE AND KNOW-HOW

- PUBLICATION AND COMMUNICATION OF SCIENTISTS (RESEARCH, INDUSTRY)
- FAIRS AND EXHIBITIONS
- INFORMATION FROM RESEARCH ESTABLISHMENTS
- CONTRACT R&D
- CONTINUED EDUCATION
- STAFF TRANSFER
- SPIN-OFF FIRMS
- LICENCES

AIMS OF PILOT PROJECTS

- o horizontal technology transfer
- o vertical technology transfer
- o innovation awareness
- o consultancy instruments
- o new services
- o information on innovation

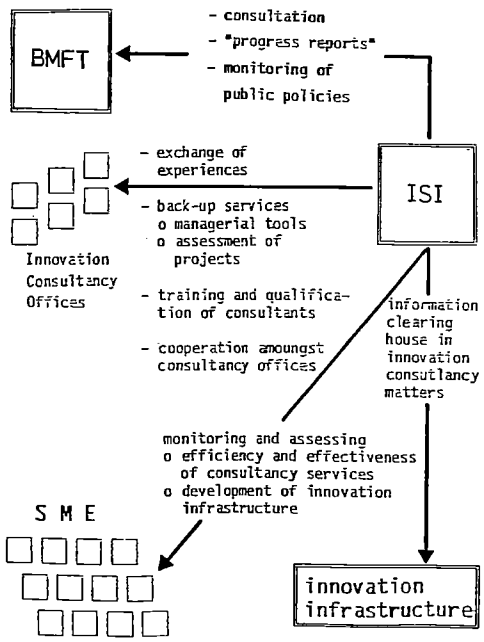
## A SHELL MODEL OF PUBLIC R&D PROMOTION



## NATURAL TRANSFER OF KNOWLEDGE AND TECHNOLOGY BY INTERMEDIARIES

- SCIENTIFIC / TECHNOLOGICAL ASSOCIATIONS (VDI, TECHNICAL ACADEMIES, etc.)
- TRADE ASSOCIATIONS
- PRODUCTION-ORIENTED SERVICE INDUSTRIES (ENGINEERING FIRMS, SOFTWARE HOUSES)
- COMMERCIAL INTERMEDIARIES (LICENSE & INFORMATION BROKERS, BUSINESS CONSULTANTS)
- PUBLIC AND SEMI-GOVERNMENTAL LIAISON OFFICES AND ADVISORY UNITS (REGIONAL DEVELOPMENT CENTERS, etc.)

ROLE OF ISI



- main clients: small firms

- awareness and motivation creation
  facilitates acceptance of consultancy

- technological and commercial problems
  interlinked

- best practise
  not: most recent research results

- local and regional network

- new services by existing organizations

## Cooperation models

o vertical

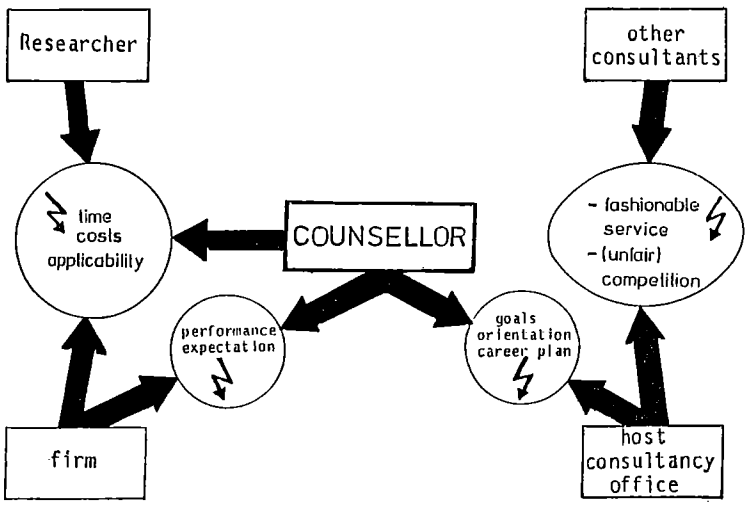
o horizontal

o functional

o public / private

o generalist / specialist

| | STAFF REQUIREMENTS | PROBLEM IDENTIFICATION | PROBLEM SOLUTION |
|---|---|---|---|
| CONTACT POINT | REPRESENTATIVE OF SPONSOR OR STAFF MEMBER ON GOOD TERMS WITH SMEs | BY REQUESTING FIRM | BY EXTERNAL SPECIALISTS |
| ADVISORY UNIT | AT LEAST 2 STAFF MEMBERS WITH TECHNICAL TRAINING | JOINTLY BY FIRM AND ADVISORY UNIT | MAINLY EXTERNAL SPECIALISTS; ADVISORY UNIT IN ROLE OF CATALYST |
| INFORMATION BROKER | AT LEAST 2 STAFF MEMBERS WITH TECHNICAL TRAINING | BY REQUESTING FIRM | DATABANK SEARCH IN COOPERATION WITH REQUESTING FIRM |
| CONSULTANCY CENTER | AT LEAST 2 STAFF MEMBERS WITH TECHNICAL/SCIENTIFIC KNOW-HOW | MAINLY BY CONSULTANCY CENTER | CONSULTANCY CENTER, AD HOC SUPPORT BY SPECIALISTS, "BEST PRACTICE" |
| TRANSFER-CENTER | 3 STAFF MEMBERS WITH TECHNICAL KNOCKOWEDLGE | JOINTLY BY FIRM AND TRANSFER CENTER | OFTEN: STAFF TRANSFER |
| DEMONSTRATION CENTER | SPECIALISTS | ASSESSMENT OF TECHNOLOGICALLY AND COMMERCIALLY VIABLE OPTIONS | |
| TECHNOLOGY CENTER | SPECIALISTS | TECHNOLOGY CENTER | BEST TECHNOLOGICAL SOLUTION |



CONFLICTS IN ORGANIZED TT ?

1. A MARGINAL TT-AGENT IN A BIG ORGANIZATION ?

2. A CAREER PLAN FOR A TT-AGENT ?

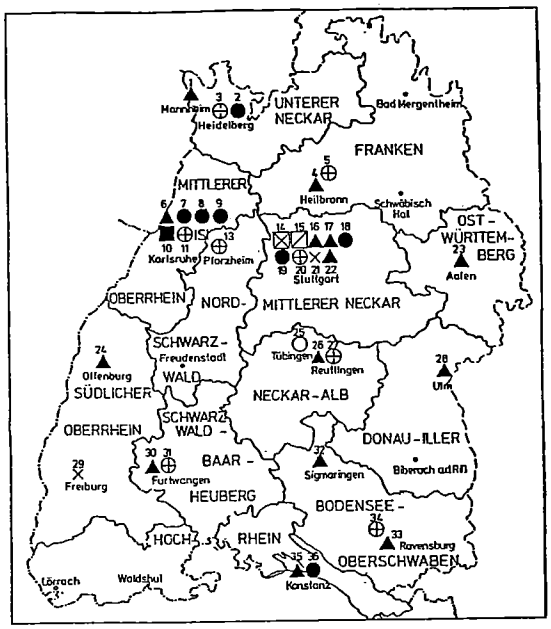
3. DIFFERENT ROLE EXPECTATIONS BY THE REQUESTING FIRM ?

4. MEDIATOR BETWEEN FIRM AND RESEARCHER ?

5. EXPANSION IN TARGET GROUP AND SERVICES TO ENSURE FUTURE OF TT AGENCY ?

6. SERVICE DIFFERENTION OR
   PERFORMANCE COMPETITION OR
   PRICE COMPETITION ?

7. DISTORTION OF COMPETITION BY PUBLIC FUNDING ?



NON -PROFIT INNOVATION ADVISORY SERVICES

IN BADEN-WORTTEMBERG

| TYPE | ORGANIZATION | NUMBER | PROFESSIONALS |
|---|---|---|---|
| CONTACT POINTS | FHS-STEINBEIS | 16 | 3o - 7o |
| CONTACT POINTS AND ADVISORY UNITS | IHK | 9 | 12 |
| CONTACT POINTS AND ADVISORY UNITS | HK | 19 | 19 |
| CONTACT POINTS AND ADVISORY UNITS | GZT | 8 | 12 |
| CONTACT POINTS (LIAISON) | UNI | 4 | 6 |
| LIAISON AND ADVISORY UNITS | GFE | 3 | 12 |
| CONSULTANCY CENTERS | RKW/WVIB | 2 | 4 |
| TECHNOLOGY CENTERS | FHG | 4 | 1o |
| TECHNOLOGY CENTERS | UNI | 6 | 15 |
| TRANSFER CENTERS | STEINBEIS | 6o | 7o (2oo) |
| ADVISORY UNITS | WIFÖ | 5 | 1o |
| ADVISORY UNITS | MBG U.A. | 3 | 5 |
| | APPR. | 15o | 2oo - 3oo |

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